

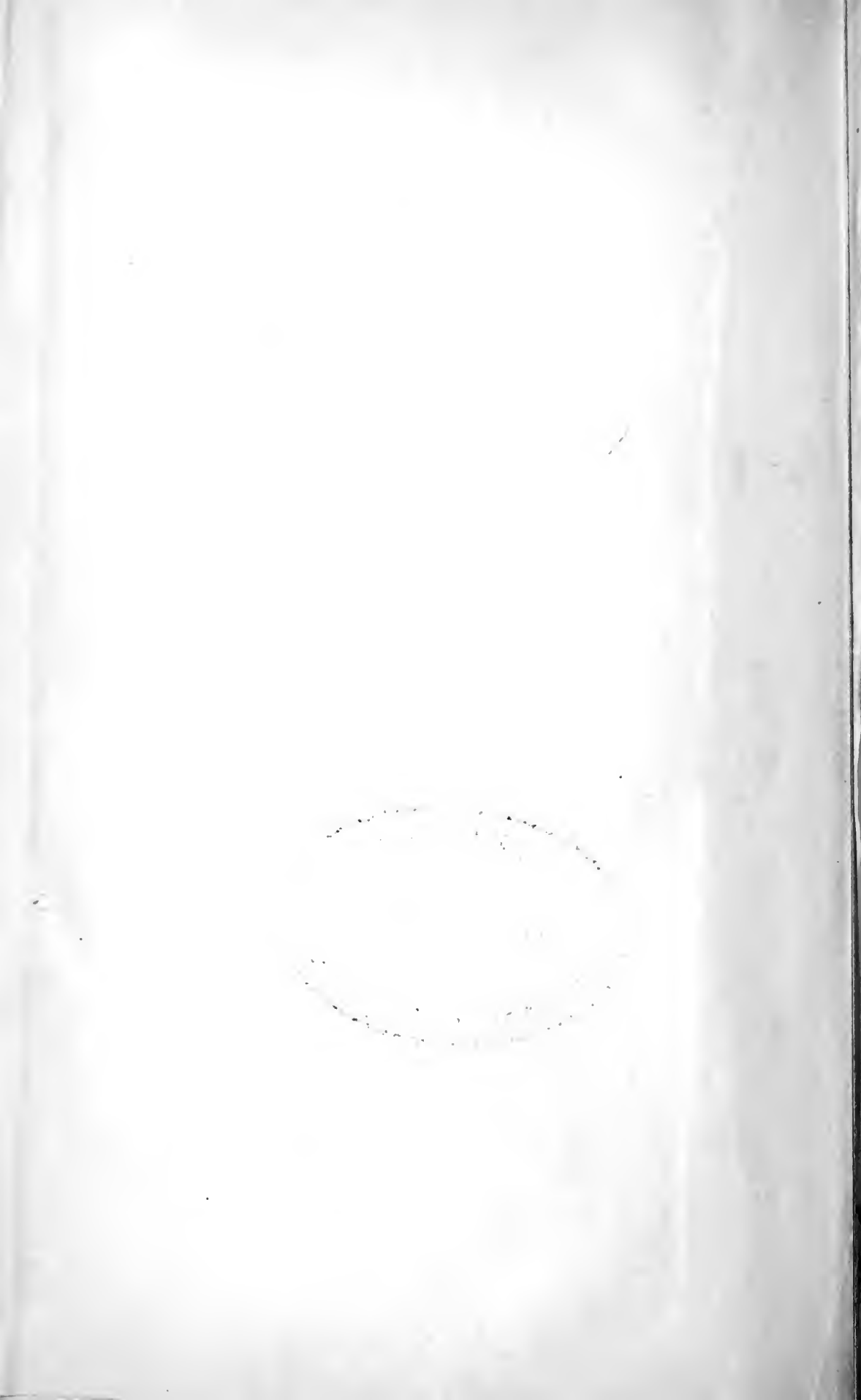


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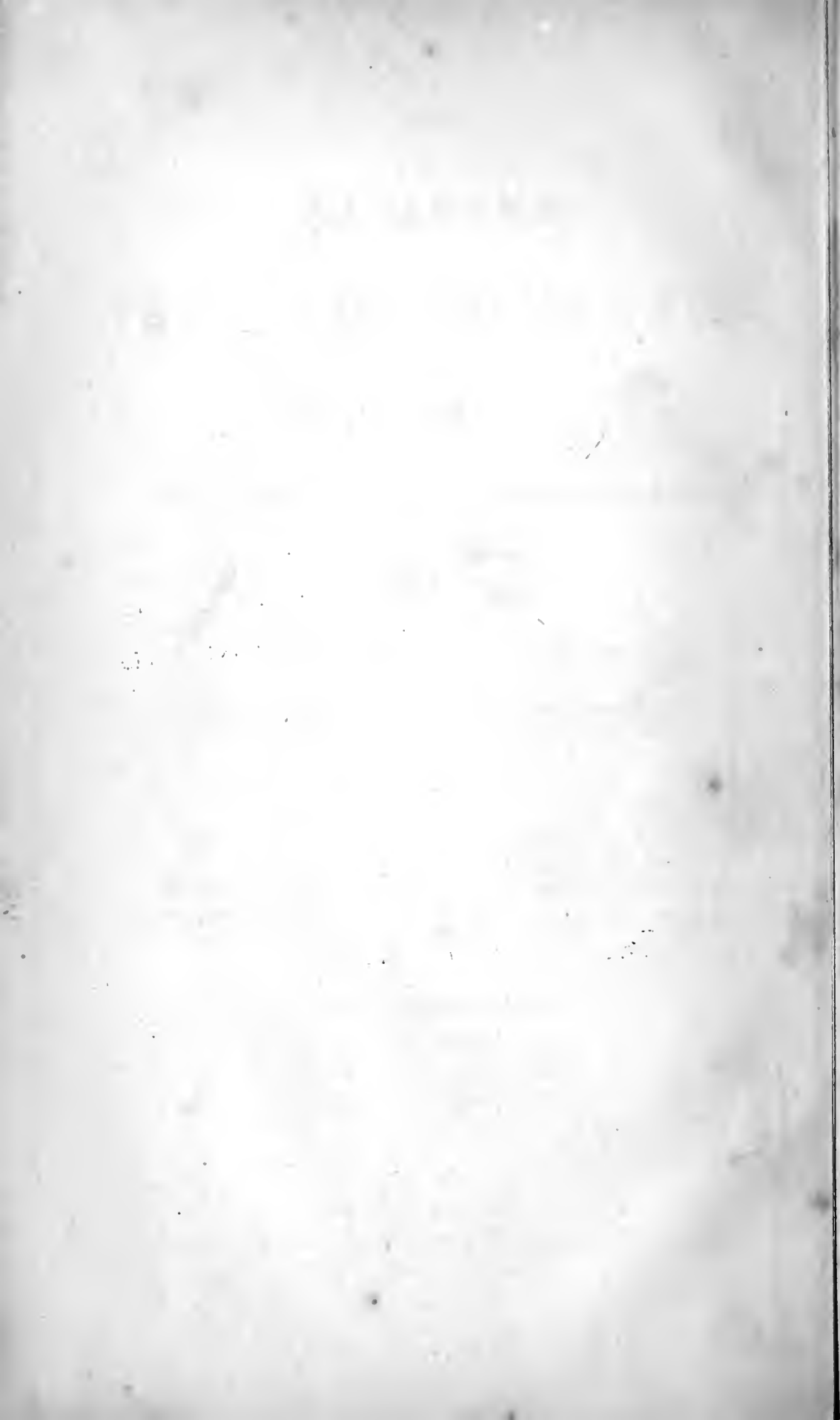


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Professor of Pharmacy in the Philadelphia College of Pharmacy.

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JANUARY, 1854.

ON COD LIVER OIL.

By EDWARD H. ROBINSON,\* of Nova Scotia.

Cod Liver Oil is derived from several species of the *Gadus* family, which frequent the Northern Atlantic Ocean, in all parts where the climate is cold, or temperate, and where a sufficiency of its proper food may be found.

The great bank of Newfoundland, extending for many miles from shore, and abounding in food of a suitable kind, affords the most agreeable resort to these animals. They are found there in vast shoals at all seasons of the year, though more abundantly from about the beginning of June, till the latter part of November, at which season the supply of their peculiar food (which is the cuttle fish,) is most plentiful. They likewise inhabit the bays and shores of Nova Scotia, New Brunswick, and of the Northern States of the Union, affording to the inhabitants of those parts, not only an inexhaustible supply of wholesome, nutritious, and palatable food, but also the procuring of them for the supply of the world gives employment to many thousands of persons, who otherwise would scarcely be able to obtain the necessaries of life, from the barren and rocky nature of the country they inhabit.

There are several varieties of the *Gadus* tribe which afford the oil of commerce. *Gadus Morrhua*, or the common cod, is the species from which the officinal oil is procured. This fish is from two to five feet in length, the head being rather large in proportion to the body; the back is spotted, and covered with small shining scales; the head is smooth, and without scales. This species, besides furnishing the officinal oil, is the most valuable as an article of commerce.

\* This paper is part of an Inaugural Essay submitted to the Faculty of the University of Pennsylvania, Feb. 22d, 1853.

The other varieties affording the oil of commerce are the *Gadus Pollachius* or *pollock*, *Gadus Merluccius* or *hake*, and *Gadus Æglinus* or *haddock*. All of the latter varieties frequent the same waters. As they subsist upon the same food, and as the fishermen are not generally particular in separating them, the oil derived from all is thrown into one common reservoir. The Haddock, however, frequents the shores, and is seldom obtained far at sea; the oil derived from this species, is, therefore, principally confined to the shore oil. The oil is derived from the livers only. There are several varieties, the difference in quality depending, in some measure, upon the locality from which the fish are obtained, though principally upon the mode of manufacture. Of the three varieties found in the market, the white is deservedly the most prized. The method of obtaining this oil, upon the shores of Nova Scotia, is as follows:

The fish are obtained within from one to five miles from shore, and if the day be favorable the fisherman fills his boat, (which is small,) at least twice during the day. As soon as the boat is filled, they are taken on shore, and handed over to women and children, who split the fish for drying, carefully putting the livers into a clean tub, or some other article used for the purpose. All the fish being thus prepared, and spread on sheds to dry, the livers are carried to a cool place, where they are kept till evening; by which time another boat load of fish has generally been obtained. Treating this second lot as the first, the livers are now all put together in a large shallow vessel of iron, usually about five feet square, and three in depth, which vessel is again inserted into another, and larger, which is set into masonry, and partly filled with water. A fire is then kindled under the outer vessel, and kept burning until the greater part of the oil has been separated from the livers. The fire is then extinguished, and when cool, the oil is dipped out, and introduced into new or clean casks. What oil remains in the livers is now pressed out; but not being of as good quality as that made without pressure, it is put into a separate cask, constituting an inferior quality. The casks containing the oil are now put into a cool place, and left undisturbed for five or six days; at the end of which time a considerable sediment has fallen, leaving a pure oil on top, which is carefully drawn off, and put into other casks: the oil is now fit



to be sent into the market. This constitutes the best quality of Cod Liver Oil. The color of this variety is a pale yellow, having a specific gravity of 920°, has a slight fishy taste, though not very disagreeable to most persons; and of all the varieties is least liable to sicken the stomach. In some parts where the fisherman is too poor to purchase the water bath, the fresh livers are put into a common iron pot, used for domestic purposes; moderate heat is then applied. As soon as the livers are somewhat broken down and softened, they are taken from the pot and introduced into a coarse canvas bag, and by pressure the greater part of the oil is forced out. This variety is not of quite as fine quality as that made with the steam bath; the color is rather darker, has a slight empyreumatic taste, and is apt to leave a peculiar burning sensation in the fauces, when swallowed, which is perceptible some time after. Another variety, of an inferior quality, is made in larger vessels, which remain at sea for weeks together, without going to the shore. The method of obtaining this variety is as follows: As fast as the fish are caught and dressed, the livers are thrown into barrels placed on deck, the tops of which remain uncovered. The livers are exposed to the action of the sun's rays; decomposition soon ensues, and the oily matter separates. That part which first rises to the top is skimmed off and put into a separate cask. The color of this variety is yellow approaching to a brown. The taste is decidedly fishy; is much more disagreeable than the shore oil; and is more liable to produce sickness of stomach. This variety is commonly known as Straits oil. The commonest variety of all is made from the remnants of the casks, from which the Straits oil has been drawn. In this variety complete putrefaction has taken place. It is of a very dark color, has an extremely offensive smell, and is more disagreeable than the other varieties. This is known as Banks oil.

The chemical composition of Cod Liver Oil is extremely complex, containing in a hundred parts about sixty per cent. of a compound composed of a peculiar brown substance—Gaduine—in combination with oleic acid. From the great pertinacity with which this substance adheres to the oleic acid it is with great difficulty separated. It is a peculiar dark brown substance, hard and brittle when dry; is insoluble in water though partly so in ether and alcohol. Sulphuric acid readily dissolves it—producing a

beautiful red color. Its chemical composition is  $C_{25} H_{23} O_9$ . Cod Liver Oil also contains about sixteen per cent. of margaric acid; nine per cent. of glycerin\*; a small proportion of butyric, acetic, phosphoric, and sulphuric acids; besides traces of iodine, bromine, iron, lime, soda and magnesia. Iron is found in the brown oil only, derived, it is said, from the iron vessels in which it is manufactured. This statement appears doubtful to me, as large quantities of the paler oils are also prepared in iron vessels. The brown oils contain a larger amount of butyric and acetic acids than the pale. On the other hand, the pale varieties contain a larger proportion of soda, magnesia, lime, and iodine. The reason ascribed for the greater quantity of salts being found in the pale varieties is, that this part being first separated from the livers, dissolves, and carries with it the soluble salts.

In regard to the relative value of the different varieties of oils for medicinal purposes, physicians differ. Some imagining they had seen better effects derived from the brown oil than from the white. Others again could perceive no difference. Experience seems to shew that the pale oils are quite as effectual, and possess the very great advantage of being much less disagreeable to the palate, and less liable to produce nausea when swallowed. Another objection to the pale oil by some persons is, that being derived mostly from the shore fisheries, it is more mixed up with oil derived from the *Gadus Pollachius* or Pollock. This, however, need scarcely be an objection, as it is now generally admitted that it is not necessary that the oil should be derived from the *Gadus Morrhua* alone, as the oil derived from all the varieties of this family possesses the peculiar medicinal properties in nearly, if not quite an equal degree.

As the oil used for medicinal purposes brings a much higher price than the ordinary fish oils, a great temptation is held out to the fisherman and dealer in oils to adulterate the officinal article with the common train oil, which is composed of a variety of oils derived from fish, which are generally not used as an article of food by man.

\*[The writer had not seen the paper of Dr. Winckler, *Am. Jour. Pharm.* vol. xxiv. 343, who has shown that no glycerin exists in cod liver oil, its place being supplied with *hydrated oxide of propyl*, a distinguishing feature of cod liver oil.—EDITOR.]

Porpoise and seal oils are the varieties most frequently used as the article of adulteration. Lard oil is also said to be used for the same purpose. No very certain method of detecting these adulterations has yet been discovered. Probably the best and surest means of discrimination, is a peculiar odor, identical with that of shoe leather, which is perceived in the genuine article. Sulphuric acid is also a valuable test. When added in a concentrated form it produces a beautiful violet color, which soon changes to a brown, and finally a black color. This effect is also produced on the common varieties of fish oil, though not in the same degree; the violet color being much less distinct, and becoming brown sooner than in the genuine article. Taste also affords a ready means of discovering the genuineness of the article to persons accustomed to its peculiar flavor.

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#### ON VERATRIA.

By JAMES BEATSON,

Manufacturing Chemist U. S. Naval Laboratory, N. Y.

The formula of the United States and British Pharmacopœias, for obtaining this article, has always appeared to me more complicated and troublesome than necessary; which has induced me to adopt a modification of the process recommended by Christison, the last time I had occasion to prepare it. The manipulation is so simple, and the result so satisfactory, that I feel confident, when generally known, it will be universally adopted, wherever this article is required to be made, either upon the small or large scale.

Seventy-three pounds (avoirdupois) of *sabadilla* were rubbed upon a coarse wire sieve, which separated the seed from the capsules, reduced to a coarse powder, in Swift's drug mill. Finding that a portion of the *veratria* was still retained with the membranous follicle, I passed the capsules likewise through the mill, which, from their elasticity, were but coarsely comminuted; the finer portions I separated with a coarse sieve, and mixed with the ground seeds, moistened with alcohol, and allowed them to stand for twelve hours. I then introduced them into a displacement apparatus, and exhausted them thoroughly with rectified alcohol, in the following manner: Into the displacement appa-

ratus I introduced thirty gallons of rectified alcohol, and when a quantity had percolated sufficient to fill my still, I commenced distillation—returning the recovered alcohol into the displacement apparatus, and continuing the percolation and distillation, until the seeds were thoroughly exhausted,—collected all the alcohol I could from the exhausted seeds, and continued the distillation until the tincture, in the bottom of the still, was of a syrupy consistence, poured this while hot into eight times its volume of cold water, threw the whole upon a calico filter, and washed with cold water, until the washings ceased to indicate the presence of veratria; mixed the washings with what passed first through the filter, and added liquor ammoniæ in excess, (about 4 lbs.) which precipitated the veratria with a little of the coloring matter. Washed the precipitate with cold water which removed the greater portion of the coloring matter. Dried with a very gentle heat, and when the moisture was completely expelled, weighed eleven and a quarter ounces of pure veratria, with but a faint shade of coloring matter.

*U. S. Naval Hospital, New York Station, October 19th, 1853.*

## METHOD OF EXHIBITING THE IODIDE OF IRON BY EXTEMPORANEOUS PREPARATION.

BY DANIEL F. WRIGHT, M. D.

*Demonstrator of Anatomy, Memphis Medical College, Tenn.*

In view of the difficulty of procuring and keeping a reliable preparation of the Iodide of Iron, I have for some time been in the habit of exhibiting that salt by extemporaneous preparation as follows:

R. Iodinii,  
 Ferri Hydrogene Redacti, aa ʒss.  
 Mellis, q. s.  
 Ext. Cinchonæ,                   ʒij.  
 Pulv. Glycyrrhizæ, q. s.

Ft. massa et in Pill. xxxij. div.

Rub the iodine and iron together till they form a fine powder; add honey enough to give the consistency of thick molasses; then rub for some time till the fumes of iodine cease to come, and the mixture assumes a greenish tinge. Rub in the extract, and add powder enough to make the mass.

Or make a mixture as follows :

R	Iodinii,	gr. xij.
	Ferri Hydrog. Redacti,	gr. viij.
	Mellis,	℥ss.
	Ext. Taraxaci,	ʒij.
	Aq. Menthæ	ʒvj.
	M. ft.	

Observe the same rule in combining the iodine and iron as in the former prescription, before the water is added.

The average dose is one of the pills or a tablespoonful of the mixture three or four times a day.

It is to be observed that the iron is given in a proportion a good deal larger than would be enough to form the iodide, as the chemical equivalent of iron, being not much more than one-fourth that of iodine, gr. viij. of the former would be enough to neutralize ℥ss. of the latter. I nevertheless use the quantities as given above, for two reasons ; first, because the tonic effects are much increased by the addition of iron in an uncombined state ; and secondly, as an effectual method of preserving the salt from decomposition by the absorption of oxygen ; this process would be constantly setting iodine free, but by observing such a precaution, the free iodine is constantly taken up by the uncombined iron. For the same purpose, apothecaries have long been in the habit of keeping a mass of metallic iron (as a watch-spring) in their syrups of the iodine of iron.

The directions given for insuring the perfect combination of the elements are highly important, as otherwise the presence of free iodine would be liable to produce a corrosive action on the coats of the stomach.

One or other of the above formulæ may be used in all cases where the tonic alterative and diuretic effects of the iodide of iron are indicated. The dose prescribed contains very nearly a grain of the salt and may, of course be increased or diminished at the discretion of the physician. I have myself used them with considerable success in cases of secondary syphilis, where the vital and assimilative functions have been much impaired by long continued disease. I have found it especially serviceable in those cases of ascites and anasarca which result from long continued intermittent and remittent fever ; in these cases I use the second formulæ, substituting syr. scillæ ʒi. for the honey. The

acetic acid in that syrup is incompatible with the iodide of iron, but, being present in only small quantities, decomposes only an inconsiderable portion of the salt, which indeed the uncombined iron is more than sufficient to restore.

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### AN EASY AND EXPEDITIOUS METHOD OF PREPARING LIQUOR FERRI IODIDI.

By B. J. CREW.

R. Iodine,	℥ij.
Iron by hydrogen,	℥ss. or q. s.
Water,	q. s.
Sugar,	℥xij.

To the Iodine previously reduced to a powder in a mortar add about f.℥ij. of water, then by degrees the iron (which should be supplied with caution, or else violent ebullition will ensue, and the contents of the mortar lost.) The chemical combination between the two ingredients is soon effected, the red color which the mixture fast assumes speedily gives place to a light brown; the solution is then poured on a filter, the residual impurities washed, and the liquid allowed to pass from the filter into a bottle containing the sugar in a coarse powder, and marked with a strip of paper pasted on the outside to contain f.℥xx. until the measure thus indicated is obtained. The bottle is then briskly agitated and the sugar dissolved.

This process (which differs from the officinal one only in the condition in which the iron is presented to the iodine, being in this case in a state of exceedingly minute division, tending greatly to rapid chemical action,) has a decided advantage in point of convenience and expedition over the ordinary mode. The union of the two ingredients is speedily effected in an ordinary mortar, and without the aid of heat, and in a much shorter time than can possibly be obtained by the usual process. The high price of iron by hydrogen of course will not admit of this process, when large quantities are operated on, but the retail Pharmaceutist will find it an exceedingly easy and convenient method, and the difference in price in the preparation being only a few cents in the pound will be much more than compensated for by the time and trouble saved.

A few words in relation to the keeping of syrup of iodide of

iron, a preparation exceedingly liable to undergo change of color and partial decomposition, without proper care, may not be out of place here, as there is an error both in books, and in the minds of many, if not most druggists, in relation to the causes productive of these changes. It is altogether wrong to attribute these effects to exposure to light, as specimens in my possession which have been exposed to the direct rays of the sun for months, with the effect of only lightening the color, will sufficiently prove. The causes of this alteration must then be looked for elsewhere. The action of the air upon this preparation has not escaped attention altogether, but has not been considered the sole cause which I believe it to be, and that the superior affinity of the oxygen of the air for the iron on the iodine, thereby setting the latter free, is a sufficient cause for the discoloration. A simple change of color, from a light green to a reddish hue, need not condemn the article. So long as there is no deposit, and the preparation quite transparent, it may be considered good, although not so nice looking. This statement may perhaps obviate the troublesome plan adopted by some very careful druggists, of covering with dark paper, or painting the vials in which the syrup is dispensed.

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#### PHARMACEUTICAL GLEANINGS.

*New process for coating Pills.*—M. Calloud, (de Chambéry) in *Journal de Pharmacie*, xxiii. 301, treats of the subject of enveloping medicinal substances in a covering to prevent unpleasant taste. After having tried gum, starch and sugar without satisfaction, owing to the hygroscopic tendency of the sugar and gum in moist air or with a moist mass, and their tendency to crack when very dry, he had recourse to the dried mucilage of flaxseed prepared with sugar, with success.

The following is his method :

Take of Flaxseed,            one part.

White sugar,            three parts.

Spring water,           a sufficient quantity.

A thick mucilage is obtained by carefully boiling the seeds, the sugar is added, and the whole of the moisture evaporated by careful desiccation.

This mixture is but very slightly hygroscopic, may be reduced



to fine powder, and employed for covering pills. This operation is effected extemporaneously with great facility. The pills slightly moistened, are rolled in the mucilaginous powder, by which they are coated with a layer of the compound.

M. Calloud has used this chiefly for carbonate of iron pills, but it may be applied to other kinds.

Garot's process of coating pills with gelatine is most applicable to disagreeably odorous substances, as assafoetida, castor, valerian, etc., which are completely masked by it. When the gelatine is previously colored with carmine the pills bore the appearance of hawthorn berries.

M. Calloud suggests another process applicable in certain cases, which is the use of butter of cacao as a covering for pills, where, owing to gastric irritation, the unmasked pills will cause disagreeable symptoms. The process is very simple: The prepared pills are thrown into melted butter of cacao, then removed with a perforated skimmer, and finally rolled in finely powdered sugar, or what is better, sugar of milk.

*Valerianate of Bismuth.*—This salt has lately come into use as a remedy in certain forms of dyspepsia. It is a white, amorphous powder, smelling strongly of valerianic acid. It may be prepared, according to Mr. Barnes, by double decomposition between nitrate of bismuth and valerianate of soda. Pure metallic bismuth is dissolved in nitric acid, any excess of nitric acid is saturated with carbonate of soda, and a solution of valerianate of soda added to the bismuth solution till it ceases to precipitate. The powder is collected on a filter, washed and dried.

Valerianate of soda may most conveniently be obtained by the process of the Dublin Pharmacopœia, (see U. S. Dispensatory, 9th edition, page 1188,) from fusel oil, bichromate of potassa, sulphuric acid, and caustic soda.

*Herring's Process for Sulphate of Quinia.*—At the meeting of the Pharmaceutical Society in October, Mr. Edward Herring communicated an account of his recently patented process for making sulphate of quinia without alcohol. The powdered cinchona bark is boiled with a solution of caustic soda, and then pressed and washed with water until the whole of the coloring matter of the bark has been removed. The bark after this treatment retains the greater part of the alkaloids in a free state.



The blood-red alkaline decoction and the washings contain a little of the alkaloids and are subsequently treated. The bark is next boiled in dilute sulphuric acid, until completely exhausted of the alkaloids. The acid decoction is concentrated, filtered, and precipitated with caustic soda. The precipitated alkaloids are next combined with sulphuric acid and the sulphates of quinia, quinine, and cinchonia separated from each other by repeated crystallization, and the quinia salt, previous to its last crystallization, is decolorized with pure animal charcoal.

To obtain the portion of alkaloids held in solution in the colored alkaline liquors, they are treated with muriatic acid in excess, filtered, and precipitated with hydrate of lime. This precipitate, after being washed, pressed, dried, and powdered, is treated with benzole, which dissolves the alkaloids. The benzoic solution is then agitated with diluted sulphuric acid, to remove the alkaloids and the supernatant benzole separated by decantation. The alkaloids are then precipitated from the acid solution with caustic soda, and treated as previously noted to separate the quinia salt.

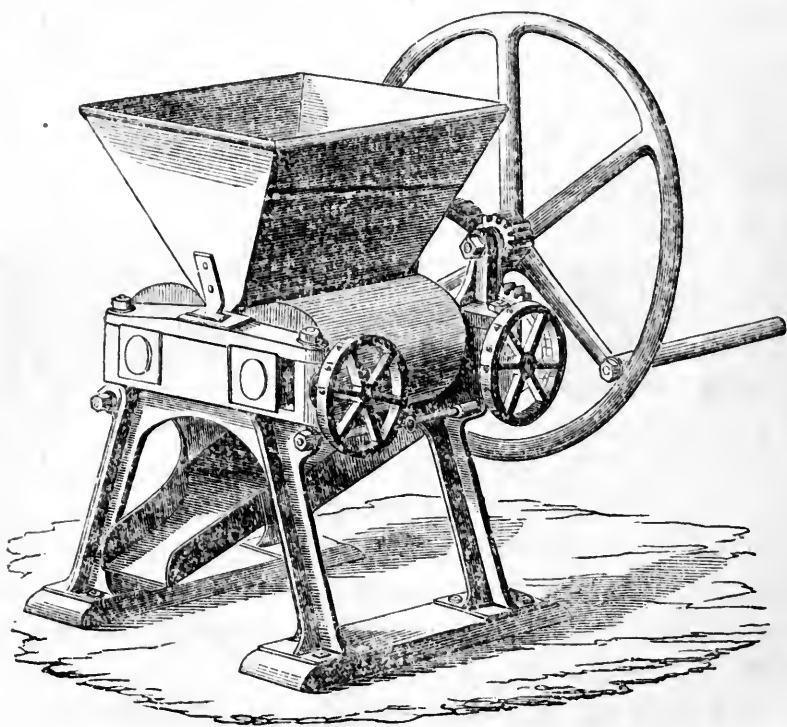
The value of this process is greater in England where the excise duty on alcohol is so enormous as to make it an important object to avoid its use in manufacturing.

*Nickel's patent Elastic plaster.*—At the same meeting, (see Pharm. Journ. xiii. 213,) Mr. Benjamin Nickels exhibited a new sort of plaster, which is peculiar in having a woven fabric similar to that of stockings, for its basis, upon which the plaster, which may be of various kinds, is spread, in the same manner as when muslin or sheepskin is employed. This plaster allows a free expansion and contraction of the muscles and does not impede the circulation, requires no exterior bandaging, and may be used as a tight strapping when desirable. It is particularly appropriate to wounds and sores on the face and hands as it may be moulded to or laid on any prominency, cavity, or tabulated parts, so as to fit even as the skin. The fabrics are made white, and tinted, and of cotton, linen, or silk of any strength required.

*Bell's apparatus for crushing herbs and roots.*—Mr. Jacob Bell, editor of the Pharmaceutical Journal (vol. xiii. 210,) describes a machine for crushing recent herbs and roots, preparatory to extracting their juices or to acting on them with menstrua. He observes that the most effectual mode of crushing herbs (such as

hyoscyamus, &c.) for extract, was by means of the stones of a drug mill, which, however, did the work so effectually that there was reason to believe the amount of product was increased by a portion of the vegetable fibre being reduced to a fine pulp and pressed out with the juice. Those who sent their herbs to a mill to be crushed, suffered the inconvenience of delay in the process, which was objectionable, as the juice ought to be evaporated as soon as expressed. Mr. Bell had tried several experiments with a view of obtaining a substitute for a drug mill. One of these had a pair of mill-stones about two feet six in diameter, working on a flat stone and turned by hand. This did not answer as the stones were not heavy enough to crush the harder portions of the plant, and the labor of working the machine by hand was too

FIG. 14.



great. Another machine was contrived having two cylinders between which the herbs were crushed. As there was no contrivance for approximating the cylinders, according to circumstances, this did not answer, as some portions of the herbs and roots passed through without being crushed, while other portions would not pass at all. By the assistance of Mr. Coffey, machinist, he had a machine (fig. 14,) made which was the best he

had seen. It has a contrivance by which the distance between the cylinders can be regulated at will by two screws with wheels attached, with their circumference divided, and numbered so that the operator can tell at a glance how far they are apart. By this means, in crushing taraxacum for instance, the process can be commenced with the cylinders so far apart as to draw in the larger roots, and afterward the process repeated with the cylinders closer together. The cylinders are of cast iron, but may be made of gun metal or hard wood. Considerable force is required to turn the wheel, which is the chief defect in the machine, but two or more persons can assist, or it may be adapted to steam power where this is at hand.

*Description.*—The machine consists of a pair of rollers which revolve toward each other by means of a pair of cogs, operated by the small cogs attached to the axle of the fly wheel which works in a large cog-wheel attached to one of the rollers. On the left hand side are the regulating wheels for approximating the rollers. Above the rollers is the hopper, in which the herbs and roots are placed. Beneath the rollers is the receiver into which the crushed material falls, and which is provided with a lateral gutter to conduct off any excess of juice. Each roller is provided with a scraper beneath to remove adhering material. The whole is firmly secured in a cast iron frame, which is fastened to the floor of the apartment.

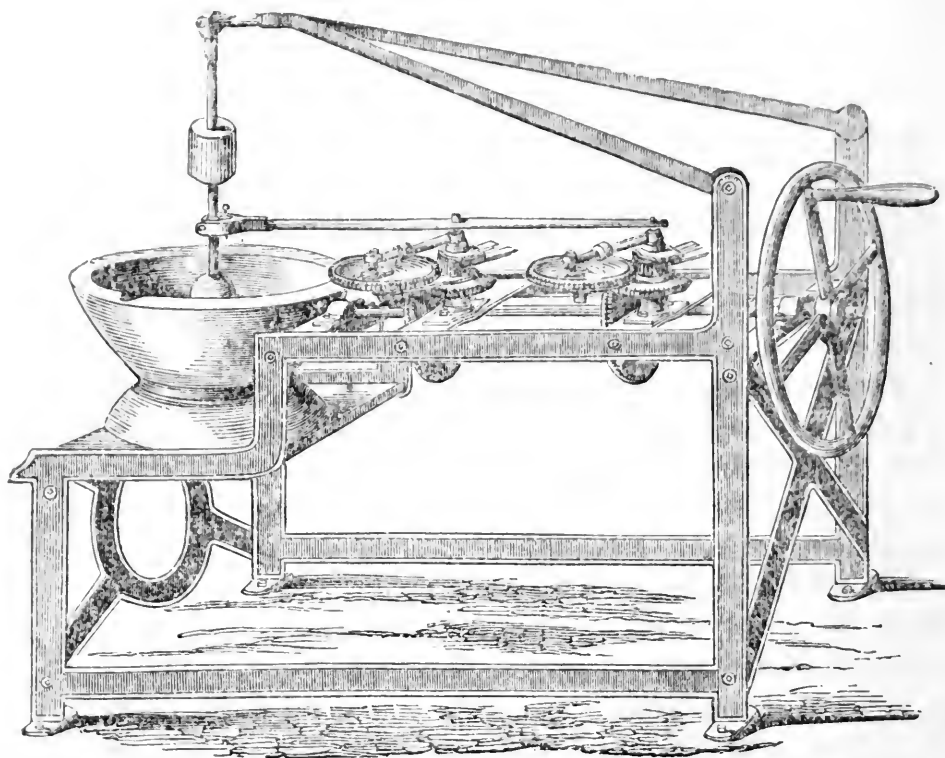
*Mode of operating.*—The material being ready, it is fed gradually to the rollers by the hopper, which are put in motion by turning the fly wheel. When the stalks of plants are firm, or the roots large they should be prepared by cutting them transversely, and when the first operation does not effectually crush the material, its coarse parts may be returned to the hopper and repassed after tightening the rollers.

*Goodell's patent grinding and levigating apparatus.*—This piece of apparatus, the invention of Mr. H. Goodell, of Darby, England, (see Pharm. Journ. xiii. 212,) is for the pulverization of drugs on a small scale. It consists in a novel and improved arrangement of machinery, whereby the operations of grinding and levigating various substances, may be performed by the aid of a pestle instead of rollers or flat comminuting surfaces.

It differs from "*Makenzie's Triturator*," figured at page 27, vol. 25th of this Journal, both in construction and in the kind of motion communicated to the pestle, which, in the machine now

to be described, is exactly that given to the pestle by a skilful manipulator when operated by hand.

FIG. 15.



“The pestle is secured at the top by a lever, to which any weight may be applied; the gearing for working the same is driven by means of a bevel-toothed gear, on the main driving shaft, which is provided with a winch handle. The mortar being placed in front of the machinery, removes the possibility of dirt from the friction of the wheels falling into it; hence it will be found of great advantage for all kinds of salts, choice colors, mercurial preparations, printers’ ink, &c. The pestle may be removed by simply taking out a screw from the driving shaft.

“The amount of labor saved is considerable, as the hardest and most difficult substances may be ground by this machine, worked by hand, as effectually as by the most powerful machinery. On a large scale, driven by steam, it will be found to do more work with less power than any mill hitherto erected. The pestle traversing over a different surface every time, removes the necessity of scrapers to keep the material constantly acted upon.

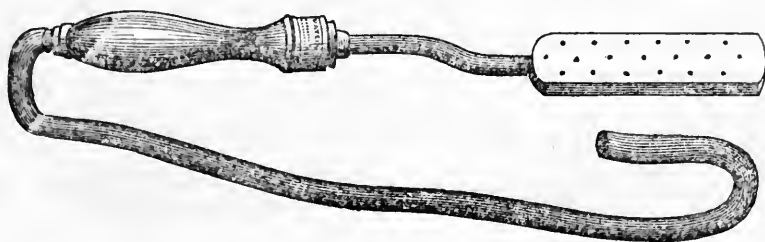
“Among the articles which are readily ground by it may be mentioned: ginger, mustard, salts of all kind, cream of tartar,

sugar, cocoa, pepper, spices, jalap, rhubarb, gums, aloes, barks, mercurial preparations, paints, and for mixing or kneading lozenges, pills, glaziers' putty, and even bread and biscuit."

The expense of this kind of apparatus, prevents its use by the majority of dispensing pharmacutists, else they could place themselves beyond the reach of the dishonest druggist and powderer, yet we do not see why those druggists and apothecaries who, residing at a distance from their sources of supply, are most likely to be victimized, should not adopt such a means to supply their own wants. There are few pharmacutists so ill educated as to be unable to tell good from bad drugs when they see them, but the best of us can be easily deceived when they are reduced to powder.

*Boggett's Patent Gas Spatula.*—The spatula, or plaster iron, (figure 16,) is described in the *Pharmaceutical Journal* for November. It consists of a blade of the ordinary shape, but hollow

FIG. 16.

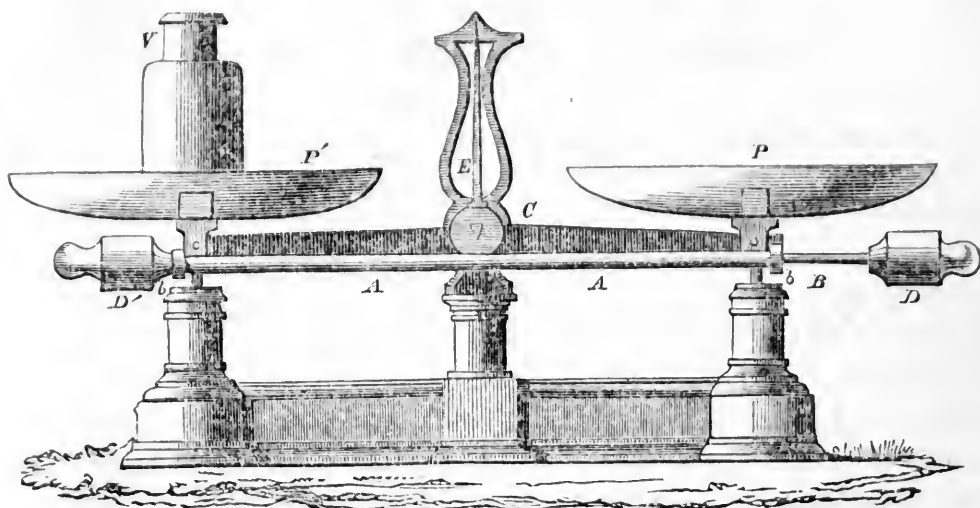


near the top, which is pierced with a number of small orifices. The handle is a metallic tube mounted with wood, communicating with the cavity of the blade. A vulcanized caoutchouc tube is attached to the end of the spatula handle by a coupling joint, the other end of the tube being similarly attached to a gas burner. In using the spatula the flow of gas is let into the tube and lighted at all the orifices on the back of the spatula. The latter soon becomes sufficiently heated by conduction, and then the operator, by curtailing the flow of gas, can keep up a regular supply of heat during the whole operation of spreading the plaster. The flexibility of the tube allows of perfect freedom of motion in the spatula. Of course it is necessary to avoid getting the plaster on the back of the spatula so as to close the orifices.

*Renou and Guérin's Weighing Machine for taking the Tare of Vessels.*—The accompanying figure (17), which is copied from

the Pharmaceutical Journal, and represents a machine originally described in Armingand's *Génie Industriel*, November, 1852,

FIG. 17.



page 233. "It is very simple, easily managed, and has the greater advantage of being applicable to any kind of balance, as well as admitting of the true weight of the substance weighed being placed alone on the balance, thus obviating any chance of error from calculation."

The arrangement consists of a brass tube A, A, in which slides a steel rod B, loaded at the ends with the knobs D. The knob D' attached to the other end of the tube acts as a counter poise to D. The tube is attached at either end of the beam by the arms b b. A small spring is placed in the interior of the tube, which, by pressing on the steel rod, B, prevents it from moving unless pulled by the operator.

When the rod is pushed into the tube till the knob D touches it, the balance is in equilibrium. When the operator is desirous of taring a vessel he places it, as V, on the pan P', and gradually draws out the rod B, until the knob counterpoises the vessel. It follows of course that the object to be tared must always be put on the pan opposite the knob D; although not suggested by the inventor, we do not see why the rod B may not be graduated to indicate the weight correctly, even to the fractions of an ounce, and thus very materially add to the usefulness of the contrivance,

as druggists often find it useful to mark the tare on bottles with a scratching diamond.

*New Apparatus for extracting Drugs.*—M. Schwaerzler (*Gazette d'Augsbourg, Avril 23, 1853,*) has stated that if a flask is three fourths filled with water, and then closed with an air-tight cork through which passes a tube reaching to the bottom of the flask, and the latter is plunged into boiling water, it is well known that the dilatation of the enclosed air will force the liquid out through the tube. If a funnel-shaped vessel is attached to the top of the tube securely by a soft cork, the fluid will be driven up into it, and a portion of air will escape through the tube. If now the flask is lifted out of the water bath, the air in it contracts, and the water in the upper vessel returns to the flask. Taking advantage of this idea, an anonymous correspondent of the *Journal de Pharmacie*, (tome xxiv. p. 134, 3e serie,) has suggested a lixivating apparatus which consists of a flask, a tubulated bell-glass inverted, and a suitable tube connecting them in the manner described. A diaphragm of perforated tin is placed within the bell-glass, and upon this the substance to be extracted is loosely put. The flask is now placed in a vessel of boiling water; the water in the flask soon commences to rise in the bell-glass until it has covered the ingredients. After contact a sufficient time, by lifting up the apparatus from the water bath, the fluid retreats to the flask, and carries with it a part of the soluble matter of the substance. This is repeated several times until the substance is sufficiently exhausted.

We have tried this experiment with a Florence flask and an inverted bottle with the bottom removed, and find it operates very well. The writer suggests that it is equally applicable to extraction with alcohol and ether, avoiding the point of ebullition, providing the upper vessel with a cover, and, in the case of ether a condensing apparatus, to avoid loss. In our small experiment, the temperature of the liquid in the upper vessel, when the air commenced to escape, was about 180° F.

[NOTE. We have examined a soldering iron, constructed at the suggestion of Mr. R. A. Tilghman, of this city, more than two years ago, which is heated precisely in the same way as Mr. Boggett's plaster spatula at page 15.—EDITOR.]



ON THE OPTICAL PROPERTIES OF THE IODO-SULPHATE OF QUININE AND DISULPHATE OF QUINIDIN, AND ON THEIR APPLICATION IN DETECTING THESE SUBSTANCES IN THE URINE OF PATIENTS UNDER TREATMENT WITH THESE ALKALOIDS.

By WILLIAM BIRD HERAPATH, M. D., of Bristol, England.

The observations of the author are contained in three papers published in the *Pharmaceutical Journal*, vol. xi. 448 and 499, and in vol. xiii. page 216. We have already (vol. xxv. page 136 of this *Journal*,) published a brief statement in relation to the iodo-sulphate. The original papers are numerously illustrated with wood cuts, exhibiting the crystalline forms of the iodo-sulphate, and the various appearances they assume under the influence of polarized light. Dr. Herapath, presuming that many readers would not appreciate some of his statements, has very properly prefaced his remarks with a short account of the manner of observing and applying the phenomena of polarized light, which we give entire.

“ Philosophers have been acquainted, since the time of Malus, with several methods of polarizing a beam of ordinary light, the principal of which may be arranged under two heads.

1st. Polarization by reflection ; as from the surfaces of glass, china, water, resin, and other polished substances not possessing metallic properties.

2d. Polarization by transmission, as

a. By double refraction, as by carbonate of lime.

b. By absorption, as tourmaline.

c. By dispersion, as by agate, &c.

The words polarization of light may, perhaps, require some explanation ; it is that faculty which certain bodies possess of so altering a beam of ordinary white light incident upon them that it is no longer capable of being transmitted by certain other transparent substances at certain angles or in certain positions, so that under the requisite conditions these crystalline diaphanous bodies become as if opaque to this polarized light.

The doubly refractive power of carbonate of lime has been generally made use of for the study of these phenomena, and



Nichol's prism, (a rhomb of carbonate of lime cut in a peculiar manner,) has the power of splitting the incident ray into two equal portions, one of which it transmits polarized in one plane, whilst it obstructs the other, or that polarized in a plane at right angles to the transmitted ray. Upon revolving this prism on its axis, that beam which was before transmitted becomes obstructed in its turn, and thrown out of the crystal by reflection; whilst that before obstructed is transmitted.

The phenomena exhibited by absorption are almost always studied by the action of the tourmaline on a beam of ordinary light. This mineral, when cut into plates parallel to the axis of the crystal, has the remarkable property of dividing the ray of light into two parts, one of which it transmits readily, but slightly altered in color; the other it wholly absorbs, at least, it disappears and is not to be found by the experimenter until the plate is revolved  $90^\circ$ , when the ray becomes transmitted, and the former one now disappears.

When two such crystals are superimposed at right angles the whole of the light disappears; the first leaf is absorbed by the first or "polarizing plate" of tourmaline, technically called the "polarizer," and the other half (slightly tinged) passes through polarized, which, as soon as it impinges upon the second crystal of tourmaline, is also absorbed. There is now no light transmitted, the field of view is as dark as midnight, or as opaque as the darkest bottle glass.

When the tourmalines are in this position, if a thin film of selenite or sulphate of lime be introduced between them at a certain angle of rotation, the light will now pass the second tourmaline and be transmitted to the eye. A certain thickness is required in this experiment as well as a certain angle of rotation. If the crystal be less than 0.00016th of an inch in thickness, the light is not transmitted; if it be above the 0.01818th of an inch, the light passes, but perfectly white; if of any intermediate thickness, from 0.00124th of an inch to the 0.01818th of an inch, the most splendid colored lights will be exhibited; either blue, yellow, red, or in various shades of these primary colors, or in various mixtures of them, so that we may have blue, orange, yellow, green, indigo, or violet according to the thickness; the law of

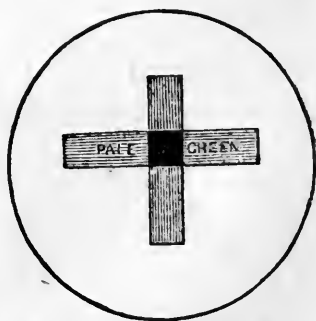
this succession of change is known by philosophers to depend upon the thickness of the plate of crystal, and the changes pass through a certain order of colors; namely, those commonly known as Newton's rings, so that a color of a certain order will always indicate a certain thickness of selenite plate."

A pupil of Dr. Herapath, (Mr. W. H. Phelps,) accidentally noticed a peculiar crystalline formation of a green color in a bottle of solution of sulphate of quinia, which on investigation proved to be the iodide of the disulphate of quinia.

It is obtained readily by dissolving five grains of ordinary disulphate of quinia in a fluid drachm of acetic acid, 1.041, (the commercial acid,) adding a few drops of tincture of iodine to the solution and heating to ebullition. As the liquid cools the iodo-sulphate of quinia crystallizes out in extremely thin transparent plates which reflect the rich, iridescent green color noticed in the elytra of the Spanish fly. By transmitted light they have only a faint olive color. By collecting these crystals on a filter, and redissolving them in alcohol, and evaporating, the salt may be obtained in a purer state. The form of the crystals vary exceedingly; sometimes they are in long flattened rectangular figures, at others in square tables; again the plates are rhomboidal, and very frequently hexagonal; occasionally stellæ, the radii of which are rhombic prisms, are formed. When the materials for a larger quantity are suffered to cool gradually, large, very thin tabular crystals, composed of parallel rectangular figures, arrayed edge to edge, are developed.

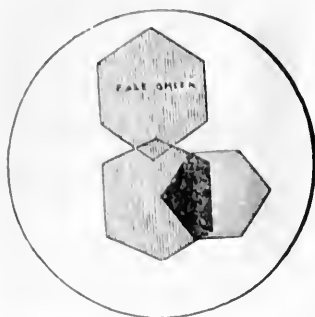
*Optical properties.*—These crystals when examined by transmitted light possess scarcely any color, having a slight olive tinge, but if two of the crystals cross each other at right angles the spot where they cross appears perfectly black, as at fig. 1, although the crystals may not exceed 500th of an inch in thickness. If the light used be but slightly polarized, as by reflection from a glass mirror at the angle of  $56^{\circ} 45'$ , these crystals assume complimentary colors, one appears green, and the other pink, and at the point at which

FIG. 1.



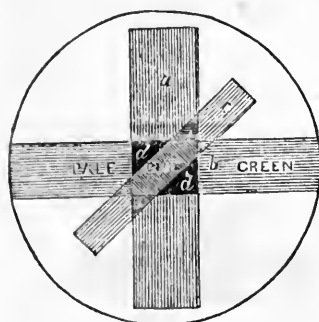
they cross, a deep chestnut brown. If, however, the crystals are placed on each other with their axes parallel, no effect is produced. This is illustrated by fig. 2, where

FIG. 2



the two hexagonal prisms overlap vertically, and the full polarizing effect is visible where the third crystal overlaps the vertical one transversely; when three crystals are examined, two at right angles and a third crossing these at  $45^\circ$ , and between them, as at figure 3, the interposed crystal permits the light to pass through at its line of contact with the others, and the phenomena of depolarization is produced, just as when the selenite plate is introduced between the tourmalines.

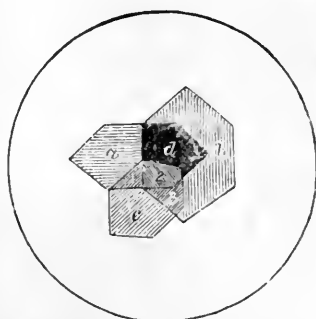
FIG. 3.



In fig. 3 the prisms *a* and *b* cross at the square *d*, and produce a perfectly dark field; the prism *c* crosses this at an angle of  $45^\circ$ ; the hexagonal space is of course bright pink from the depolarizing effect described; the four small triangular spots are somewhat darkened, in consequence of polarization occurring from the reciprocal action of *c* on *a* and *b*.

In figure 4, the three hexagonal plates exhibit the same phenomena; *a* and *b* cross each other at  $90^\circ$ , whilst the plate *c* intersects them at  $45^\circ$ , passing between them; the half crystal *d* pentagonal in form, is the polarized space, and No. 2, where *c* interposes, producing pink as before; spaces 1 and 3 are partially polarized and darkened.

FIG. 4



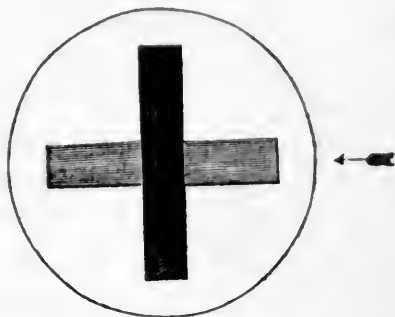
When a pair of these crystals at right angles are viewed with a single tourmaline, or Nichol's prism, the crystal, whose axis is transverse that of the tourmaline, is black as night, whilst the other, whose axis is parallel with that of the tourmaline, is perfectly transparent, as in fig. 5. If the tourmaline is now

rotated  $90^\circ$ , the position of the crystals remaining the same, the appearance of the crystals is then reversed; that which was

FIG. 5.



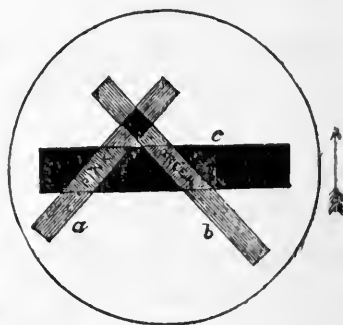
FIG. 6.



transparent becomes opaque, and the opaque one diaphanous, as in fig. 6.

The depolarizing effect of the crystals is best seen by using one tourmaline, placing a crystal of iodide across its axis, so that it shall become opaque, and then two crystals of the iodide across this at an angle of  $45^\circ$ , so that their opposite ends shall cross each other at  $90^\circ$  at a distance from the opaque crystal, as in fig. 7, *a*, *b*, *c*. The crystals *a* and *b* being in the depolarizing angle, exhibit this phenomenon, except where they cross each other at right angles, at which point complete polarization is effected, as is seen by the black square. Where *a* and *b* cross the polarized field of *c*, depolarization takes place, and two rhomboidal spaces, pink and green, appear.

FIG. 7.



When two tourmalines are employed, the results are more com-

FIG. 8.

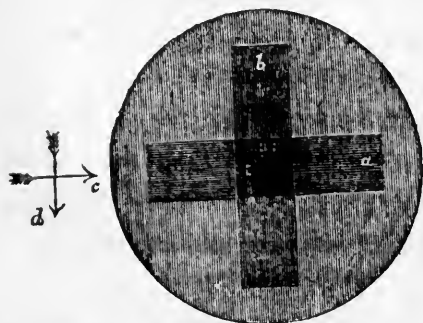
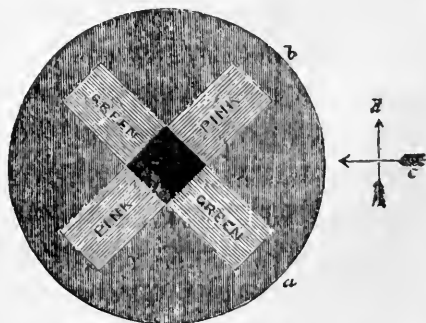


FIG. 9.

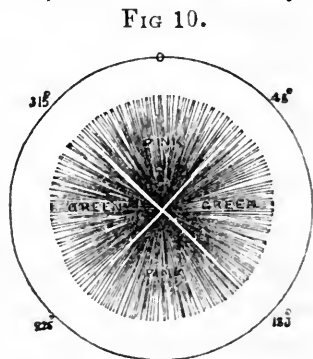


plicated; either both crystals become opaque, as *a b*, fig. 8, or

if the tourmalines are rotated  $45^\circ$ , so as to place the crystals at the depolarizing angle both crystals become colored, *a* being green and *b* pink, as in fig. 9. If 8 hexagonal tables are placed with their axes on the radii of a circle  $45^\circ$  apart, every alternate crystal will be black and the intermediate ones colored pink and green.

Other and different colors are developed when only the inferior tourmaline is employed with a selenite plate superimposed. Dr. Herapath concludes his second essay with directions for mounting crystals of iodo-sulphate of quinia so as to use them in lieu of tourmalines in polarizing apparatus, to which he considers them not only equal, but as possessing the power of polarization with five times the intensity that the best tourmalines are capable of.

When disulphate of quinidin is dissolved in acetic acid, and a drop placed on a glass is allowed to evaporate, it is found to crystallize in tufts of radiating prisms, sometimes arranged in a perfect circle. When such a tuft is placed on a tourmaline surmounted by the red selenite stage, two opposite quadrants of the circle in fig. 10, between  $315^\circ$  and  $45^\circ$ , and between  $225^\circ$  and  $135^\circ$ , appear decidedly pink, whilst the other two between  $45^\circ$  and  $135^\circ$  and between  $315^\circ$  and  $225^\circ$  are green and greenish yellow. This appearance is so striking as to characterize quinidin.



We are now prepared to understand our author's remarks in his last paper, (*Pharm. Journal*, xiii. 216,) "On the discovery of quinine and quinidine in the urine of patients under medical treatment, with the salts of those mixed alkaloids." After alluding to the interest manifested by professional men in tracing or endeavoring to trace the course of remedies ingested, and the importance of this kind of knowledge in properly understanding the *modus operandi* of medicines, he observes that one drawback to the progress of inquiry in this direction has been the difficulty of recognizing the organic principles of medicinal agents in the animal fluids with such certainty as to render their presence undoubted.

Having been struck with the facility of application, and the extreme delicacy of the reaction of polarized light, when experi-

menting on iodosulphate of quinine, he determined to bring this method practically into use for the detection of minute quantities of quinine in organic fluids, and succeeded so entirely that he was able to demonstrate the presence of quinia, "even in quantities not exceeding the one hundred thousandth part of a grain; in fact, in quantities so exceedingly minute that all other methods would fail in recognizing its existence." The same process slightly modified has enabled our author to recognize quinidin in the urine of a patient in an unaltered state.

The following observation relative to the examination of urine for the alkaloids in question, and the subsequent remarks relative to commercial quinine and quinidin, are taken verbatim from Dr. Herapath's paper, together with the illustrations.

"*A Chemical examination of the urine of a man suffering from tetanus, in consequence of an injury to the great toe.*—Amputation was performed at the infirmary by Mr. Morgan. The patient's name was R. Alexander.

The tetanic symptoms were treated by the exhibition of five grains of disulphate quinine with half a grain of *Cannabis Indica* every three hours; he consequently took forty grains of sulphate of quinine in the period of twenty-four hours.

The urine had a greenish-yellow appearance, and upon standing deposited a brownish-yellow sediment; it was slightly acid, and had a specific gravity of 1.032. The sediment examined by the microscope showed prisms and lozenges of uric acid, with amorphous urate of ammonia.

The deposit treated upon the field of the microscope with ammonia instantly became changed; the crystals of uric acid were rendered more clearly defined in consequence of the amorphous urates being dissolved. The phosphate of ammonia and magnesia was subsequently deposited upon the side as a cloudy mass, when seen by the unassisted vision, but as a magma of very minute radiating needles when magnified sixty diameters.

The fluid urine was carefully decanted from the amorphous and crystalline deposit.

A. Half-a-pint of this urine was treated with liquor potassæ until decidedly alkaline; it was then repeatedly agitated with pure washed ether; the ethereal solution having been allowed to separate by twelve hours' repose, was carefully evaporated by a warm water bath; .79 grains of extract was left.

B. A magma of phosphates and adhering alkaloid still remained above the urinous substratum; this was also removed by a pipette and transferred to a porcelain capsule; evaporated to dryness at  $212^{\circ}$ , and this residue exhausted by ether; the ethereal solution evaporated to dryness by a warm water bath, as before, gave .61 additional alkaloid.

Therefore  $\frac{a}{.79} + \frac{b}{.61} = 1.4$  grain of alkaloid were obtained by these two operations from the eight fluid ounces of urine.

Now to determine whether it was quinine, the following process was followed:—

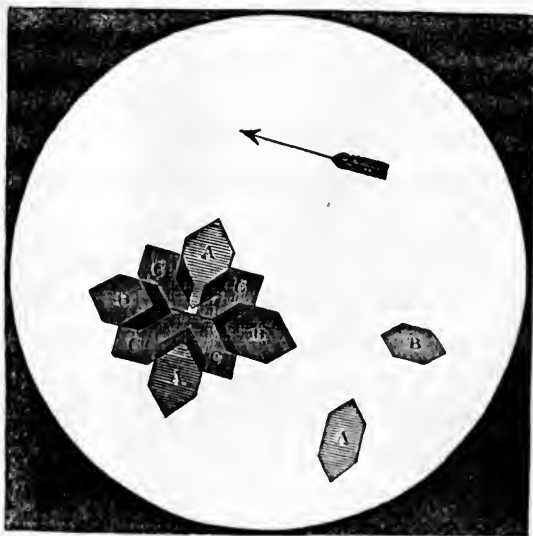
*Test-fluid.*—A mixture of three drachms of pure acetic acid, with only one fluid drachm of rectified spirit of wine, to which six drops of diluted sulphuric acid were added.

One drop of this test-fluid placed on a glass slide, and the merest atom of the alkaloid added; time given for solution to take place; then upon the tip of a very fine glass rod an extremely minute drop of the alcoholic solution of iodine added; the first effect is the production of the yellow or cinnamon-colored compound of iodine and quinine, which forms as a small circular spot; the alcohol separates in little drops, which by a sort of repulsive movement drive the fluid away; after a time the acid liquid again flows over the spot, and the polarizing crystals of sulphate of iodo-quinine are slowly produced in beautiful rosettes. This succeeds best without the aid of heat.

To render these crystals evident, it merely remains to bring the glass slide upon the field of the microscope with the selenite stage and single tourmaline beneath it; instantly the crystals assume the two complementary colors of the stage; red and green, supposing that the pink stage is employed, or blue and yellow provided the blue selenite is made use of. All those crystals at right angles to the plane of the tourmaline producing that tint which an analyzing plate of tourmaline would produce when at

In FIG. 1 and 2 the inferior tourmaline and selenite stage are employed. The arrows show the plane of the tourmaline.

FIG. 1.—Red Stage.



A. Red. B. Light Green. C. Brownish Yellow.



right angles to the polarizing plate; whilst those at  $90^\circ$  to these educe the complimentary tint, as the analyzing plate would also have done if revolved through an arc of  $90^\circ$ . Vide figs. 1 and 2.

This test is so ready of application and so delicate that it must become *the test, par excellence*, for quinine. Vide figs. 1 and 2.

Not only do these peculiar crystals act in the way just related, but they may be easily proved to possess the whole of the optical properties of that remarkable salt of quinine, so fully described by me in the *Pharmacuetical Journal*, vol. xi., pages 448 and 499, and the chemical analysis of which was published in vol. xii. of the same Journal; in fact, these crystals are perfectly identical with the sulphate of iodo-quinine in every respect.

To test for quinidine, it is merely necessary to allow the drop of acid solution to evaporate to dryness upon the slide, and to examine the crystalline mass by two tourmalines, crossed at right angles and without the stage. Immediately little circular discs of white, with a well defined black cross very vividly shown, start into existence, should quinidine be present even in very minute traces. Vide fig. 3.

This is generally the case if hospital quinine or that of the

FIG. 2.—Blue Stage.

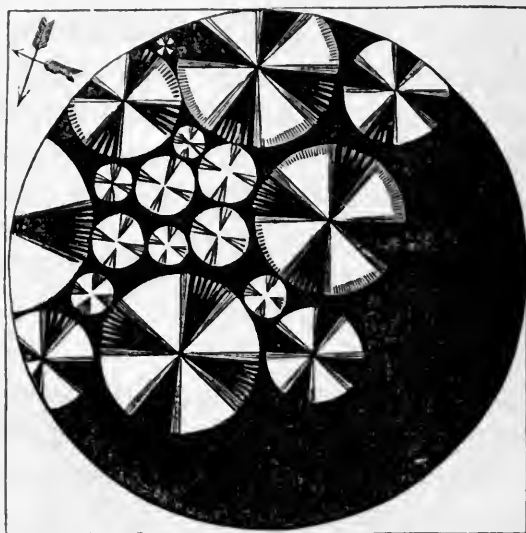


D. Yellow.

E. Blue.

F. Lilac.

FIG. 3.



Water.



British Alkaloid Company has been employed—these severally contain a very large percentage of quinidine; the former at least fifty, the latter about twenty; but Howard's disulphate of quinine scarcely contains five per cent. of quinidine, according to my experiments. These substances are easily separated in consequence of the much greater solubility of the disulphate of quinidine in cold water.

One part of disulphate of quinine requires.....740 at  $60^{\circ}$ ;

One part of disulphate of quinidine requires....340 at  $55^{\circ}$ ;  
so that the latter is more than twice as soluble.

If we employ the selenite stage in the examination of this object, we obtain one of the most gorgeous appearances in the whole domain of the polarizing microscope; the black cross at once disappears, and is replaced by one which consists of two colors, being divided into a cross having a red and green fringe, whilst the four intermediate sectors are of a gorgeous orange yellow. These appearances alter upon the revolution of the analyzing plate of tourmaline: when the blue stage is employed the cross will assume a blue or yellow hue according to the position of the analyzing plate.

These phenomena are analogous to those exhibited by certain circular crystals of boracic acid, and to those circular discs of salicine (prepared by fusion\*), the difference being that the salts of quinidine have more intense depolarizing powers than either of the other substances, besides which the mode of preparation effectually excludes these from consideration. Quinine prepared in the same manner as the quinidine has a very different mode of crystallization; but it occasionally presents circular corneous plates, also exhibiting the black cross and white sectors, but not with one tenth part the brilliancy, which of course enables us readily to discriminate the two.

Having shown in my previous papers that *none* of the vegetable alkaloids, when treated with sulphuric acid and iodine, possess the power of forming crystalline compounds of similar properties, and these artificial quinine tourmalines being pre-eminent in their action on light, it follows that the existence of these crystals is a positive demonstration of the presence of quinine. It has also been proved by me that quinidine( $\beta$  quinine) cannot produce

\* I am indebted to my friend Mr. John Thwaites for this fact.

them; therefore we perceive that quinine passes out of the system without experiencing any elementary change.

One subject is worthy of remark; the patient was taking forty grains of the disulphate of quinine (and quinidine); there were found 1.4 grain mixed of alkaloids, which would be equivalent to 1.884 grain of the disulphate of commerce; and if the patient voided three pints of urine in twenty four hours, we should only account for 11.304 grains of the remedy used, leaving a deficiency of thirty grains; three fourths of the substance being yet unaccounted for, which has either been assimilated in the body, or has been destroyed in its transit through the vascular system. It would be interesting to undertake a series of quantitative analyses in the healthy subject to determine these points:—

1st. Whether the whole of the quinine ingested disappears by the kidneys.

2ndly. If not, whether it passes out by other excretory organs, and which.

3rdly. To discover at what period after ingestion all evidence of its elimination from the kidneys ceases.

These questions having been answered, in health, they must be repeated when quinine has been used remedially, and by so doing we shall perhaps be in a position to say what the *medical equivalent* of quinine may be in a given disease."

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## ON FLUID EXTRACT OF GENTIAN, AND SOME REMARKS ON OTHER TONIC FLUID EXTRACTS.

BY WILLIAM PROCTER, JR.

Gentian is largely prescribed by physicians when a simple tonic is indicated, and generally in the forms of solid extract, tincture, or infusion. There are numerous cases requiring the prolonged use of this tonic, and as the form of infusion is most frequently preferred, the necessity of preparing it at short intervals is requisite by reason of its decomposable nature. For a like reason the U. S. Pharmacopœia infusion has been made a *sub-tincture*, but this is so dilute as to be too bulky for the traveller, and as requiring a long time to make when required in small quantities from time to time. In view of the advantages

to be derived from having a more concentrated fluid preparation, permanent and yet so slightly alcoholic as to avoid objection on that score, the following formula is offered :

Take of Gentian, in coarse powder, sixteen ounces (Troy.)

Water, a sufficient quantity,

French brandy, six fluid ounces,

Macerate the gentian in two and a half pints of water for twelve hours, and having introduced it into a suitable percolator, allow the infusion to pass slowly, adding water at intervals until five pints of liquid have passed. Evaporate this to ten fluid ounces by means of a water bath, add the brandy, and strain through cotton flannel.

(The process may be varied by using the press, in lieu of the displacement process, macerating in three several quantities of two pints each; and four ounces rectified alcohol may be used in lieu of the brandy, in which case the evaporation should be stopped when the infusion is reduced to twelve fluid ounces. When economy is not to be consulted, pure French brandy is to be preferred.)

Fluid extract of gentian has a thin syrupy consistence, a dark brown color, free from sediment and transparent in thin strata. With water it forms a clear mixture, and may be given in doses of half a teaspoonful to a teaspoonful, which represent half a drachm to a drachm of gentian root.

When it is desirable to associate aromatics, they may be added in the form of tincture, in place of a part of the brandy, or the aromatics in substance may be extracted by the brandy and the tincture thus formed added to the evaporated solution of gentian. As this fluid extract is prepared more especially to facilitate the extemporaneous prescribing of gentian, I have preferred to retain its simple form, to offering any compound including aromatics. If it should be desirable to use the association of ingredients found in the officinal compound infusion, a perfect representation of it in a concentrated form may be made as follows:—

Take of Gentian, in coarse powder, 16 ounces.

Bitter Orange peel, in coarse powder, 4 ounces.

Coriander seeds, “ “ “ 4 ounces.

Water,

Alcohol, each a sufficient quantity.

Extract the gentian with water in the manner directed for the

simple fluid extract and evaporate it to ten fluid ounces. Macerate the orange peel and coriander in a mixture of eight fluid ounces of alcohol and four fluid ounces of water for twelve hours, introduce them into a percolator and pour gradually on sufficient diluted alcohol to displace twelve fluid ounces of tincture. Evaporate this to six fluid ounces by a gentle heat, (120° F.) add it to the solution of gentian while hot, and strain. When finished, the fluid extract should measure a pint.

Thus prepared compound fluid extract of gentian is a colored, thin, syrupy liquid, similar to the simple fluid extract.

With fluid extract of gentian as a basis, the physician may prescribe various combinations of ingredients to meet particular indications. For instance should an aperient tonic be desired with ant-acid properties, the following form may be used :

R. Extracti Gentianæ fluidi,	f.℥ij.
Extracti Rhei fluidi,	f.℥ij.
Potassæ Bi-carbonatis,	℥j.
Tincturæ Zingiberis,	f.℥ij.

Misce sec. art.

A teaspoonful of this mixture will be equivalent to about forty grains of gentian, six grains of rhubarb and three grains of bicarbonate of potassa.

When a chalybeate tonic is desired, the following association may be adopted :

R. Ferri et quiniæ citratis,	℥j.
Aquæ,	f.℥vj.
Liqua et adde	
Extracti Gentianæ fluidi,	f.℥ij.

A teaspoonful of this liquid will represent about 45 grains of gentian and three grains of citrate of iron and quiniæ, which last contains half a grain of citrate of quinia.

Or should the iron not be indicated the fluid extract of bark may be substituted for the citrate of iron and quinia.

A fluid extract of columbo may be prepared in a similar manner, except that the extracting menstruum should consist of one part of alcohol and three of water.

When the aromatic or stimulant tonics, as chamomile, cascarilla, etc., are wanted in the form of fluid extract, the process laid down in this Journal for fluid extract of *serpentaria*, (vol. xxiii., page 19,) should be followed.

## ON IGASURIN.

By M. DESNOIX.

If the active properties of *nux vomica* have been long known, the same is not true of all the principles to which these seeds owe their properties.

During my residence at the Central Pharmacy of the Hospitals I have had, at different times, to prepare strychnia, and have treated each time about 100 kilogrammes of rasped *nux vomica*. In the course of these operations I discovered a substance which I have called *Igasurin*. Although this name implies that it had been first noticed in the bean of St. Ignatius, which is called *igasur* in the country where it grows, I have not changed it, because I am persuaded that it will be found not only in that seed, but also in the false *angustura*, and perhaps other *strychnæ*.

*Igasurin* is found in the mother waters from which the strychnia and brucia have been precipitated by lime, at the temperature of ebullition.

*Chemical Properties.*—Acids act on *igasurin* according as they are concentrated or dilute. Concentrated nitric acid reddens it very strongly, and this color is changed to violet on adding chloride of tin in drops. It behaves therefore like brucia in this respect. I have, however, remarked, that the color communicated to *igasurin* is more intense than that caused by brucia, which has led me to suppose that this property of brucia was owing to the presence of *igasurin*. I have endeavored to verify this supposition by experiment, but without success. I think, nevertheless, that it will prove to be correct.

Sulphuric acid causes first a rose color, which afterwards passes to yellow and greenish yellow, which is also the case with brucia.

Dilute acids combine with it and form salts which in general are soluble in water, and crystallize with facility, the nitrate also.

Potassa, soda and ammonia precipitate it from its solutions; if in excess, especially potassa, the precipitated *igasurin* is redissolved. Iodide of potassium at first causes no change in a solution of *igasurin*, but slowly light reddish yellow crystals appear on the sides of the vessel. Ioduretted iodide of potassium, on the

contrary, causes a brown precipitate analogous to those indicated by Pelletier. Chlorate of potassa causes no precipitate in solutions of igasurin. Its solutions, on the contrary, are precipitated yellow by bichloride of platinum, and white by tannin and nut galls.

Igasurin is precipitated under the form of crystalline needles by bicarbonate of soda in the presence of tartaric acid ; strychnia presents the same character, with the difference that the power is not the same, whilst brucia in the same conditions is not precipitated by these reagents.

*Salts of Igasurin.*—*The sulphate* is prepared easily by saturating diluted sulphuric acid with the alkaloid. It crystallizes in white silky crystals, soluble in four parts of boiling water, and in ten parts when cold. *The chlorohydrate* is prepared in the same manner as the sulphate ; it crystallizes, and is more soluble ; two parts of boiling and four of cold water suffice to dissolve it.

*The Nitrate* may also be obtained in transparent crystals by saturating very dilute nitric acid with igasurin, and submitting the solution to spontaneous evaporation in a dry, airy place. By double decomposition between sulphate of igasurin and nitrate of baryta, a solution of this salt may be more readily obtained, which requires to be evaporated spontaneously to avoid coloration.

M. Desnoix suggests that the chemical history of igasurin is incomplete, and proposes in a future communication to extend it. As regards its therapeutic action, he thinks, from the result of experiments on animals, that it is intermediate between strychnia and brucia. Steps were taken to have it tried at the hospitals, but he had not received a report.

In conclusion, the author thinks he is authorized to consider this principle distinct from strychnia and brucia, because of its greater solubility in water, by its solubility in weak alcohol, by its crystalline form, by its reaction with nitric acid, by its action on the animal economy, by its reaction with chlorine, because bicarbonate of soda and potassa in the presence of tartaric acid precipitate it from its solution, and finally by the marvellous facility with which it is crystallized.—*L'Abiella Médicale, from Répert. de Pharm.*

## ON THE MANUFACTURE OF AMMONIA AND AMMONIACAL SALTS.

During the last twenty-five years, the manufacture of liquid ammonia and of ammoniacal salts (more especially the sulphate of ammonia) has received considerable development, insomuch that in nearly all the principal towns of the kingdom, manufactories of these articles are now to be met with. The development of this manufacture has arisen from the immense increase in the production of the raw ammonia furnished by the continued extension of gas-lighting, the low prices at which it is obtainable from this source rendering the application of liquid ammonia, and of ammoniacal salts, accessible to various useful purposes in the arts, manufactures, and agriculture, to which previously the cost of these articles formed an impediment. Liquid ammonia is usually obtained in the commercial scale by submitting a mixture of sulphate or muriate of ammonia and lime to the action of heat, in a closed iron pan or still; the ammonia passes off in the state of vapor, and is condensed by passing through water contained in a series of Woulfe's bottles, formed of lead or earthenware, whence the solutions of ammonia may be drawn off, of any required strength or density. The residuum in the still is either sulphate or muriate of lime, according to the salt employed.

Carbonate of ammonia is obtained by exposing a mixture of sulphate or muriate of lime to the action of heat enclosed in a retort; carbonate of ammonia and sulphate or muriate of lime are thus obtained; the former passes off into large leaden chambers, called balloons, where it is condensed in solid masses, whilst the latter remains as a residuum in the retort. The impure carbonate of ammonia thus obtained is then placed in iron pots, and heated, by which means the pure salt is volatilized and collected in suitable receiving or subliming vessels.

The sulphate and muriate of ammonia may be obtained by the action of sulphuric or muriatic acid on certain sulphates and muriates in the carbonate of ammonia contained in the ammoniacal waters of the gas-works or other sources, the sulphuretted hydrogen contained in these waters being got rid of by the assistance of the metallic oxides, &c. The solutions of these salts are then evaporated and crystallized. The sublimed muriate of ammonia (sal



ammoniac) is obtained, either by heating the crystallized muriate or a mixture of sulphate of ammonia and common salt, or sulphate of ammonia and muriate of lime, in iron pots, and collecting the sublimed salt in suitable receivers, attached by means of luting to the subliming pots.

As the mode of manufacturing these articles vary according to particular circumstances, we shall proceed to mention the chief sources whence ammonia and its salts are obtainable, and describe some of the numerous processes which have of late years been devised for obtaining them in the commercial scale.

*Ammonia from Soot.*—The soot arising from burning the dung of camels and other animals appears to have been the original source of ammonia. Egypt formerly supplied large quantities of muriate of ammonia obtained from this source. Twenty-six pounds of soot are said to yield six pounds of sal-ammoniac. From coal soot also, a considerable quantity of ammonia, in the state of carbonate and sulphate, may be obtained, either by sublimation or lixiviation with water. It is chiefly on account of the ammonia contained in soot that this substance forms so valuable a manure.

*Ammonia from Bones, &c.*—The destructive distillation of bones for the purpose of obtaining animal charcoal, used as a decolorizing agent in the refining of sugar and various chemical salts, is a source of ammonia. For this purpose, the bones are carbonized in suitable sized retorts or pots, the products of distillation being water, carbonate of ammonia, the oil called Dippel's oil, and some incondensable gases. The following are the particulars relative to the products, as manufactured (in France) on the large scale, of animal charcoal and ammoniacal salts:—Bones of various kinds, 46,574 tons; silk waste and old leather, 30 tons; sulphuric acid,  $11\frac{1}{2}$  tons; common salt, 80 tons; and plaster of Paris,  $2\frac{3}{4}$  tons, were the raw materials employed. The products obtained therefrom, were 2,400 tons of animal charcoal, 44 tons of sal ammoniac, 100 tons of sulphate of soda, 4 tons of liquor ammonia, and 25 tons of sulphate of ammonia. The ammoniacal salts are obtained in this manufactory as follows:—

*Sulphate of Ammonia.*—The condensed liquors from the carbonization of the bones are separated into two distinct states, the oily and the aqueous products, the latter of these containing carbonate of ammonia, are treated with sulphate of lime, whence result in-



soluble carbonate of lime and sulphate of ammonia in solution, which is evaporated and crystallized.

*Muriate of Ammonia.*—This salt is obtained by either of the three following methods :—1. By decomposing sulphate of ammonia by means of common salt. 2. By treating the crude carbonate of ammonia liquors obtained from the distillation of bones with muriatic acid. 3. By decomposing the crude carbonate of ammonia liquors with muriate of manganese, the residuum obtained in the manufacture of chlorine. In either case, the solution of the salts obtained is evaporated and crystallized, and afterwards, if desired, sublimed. 204 lbs. of bones being carbonized, yield a sufficient quantity of carbonate of ammonia to furnish from 102 to 122 lbs. of sublimated sal-ammoniac.

*Carbonate of Ammonia.*—This salt is obtained by submitting a mixture of  $65\frac{1}{4}$  lbs. of sulphate of ammonia, and 99 lbs. of carbonate of lime to distillation, whence is obtained about 41 lbs. of crude carbonate of ammonia, which is afterwards refined.

*Liquid Ammonia.*—This is obtained by heating together in a suitable retort or vessel,  $61\frac{1}{4}$  lbs. of calcined sulphate of ammonia, and  $61\frac{1}{4}$  lbs. of slaked lime. The disengaged gas is collected by absorption in water contained in a series of Woulfe's apparatus, through which it is made to pass.

M. Leblanc, to whom we owe the process for obtaining soda from common salt, originated the following method of manufacturing muriate of ammonia. He employed two tight brick-kilns for this purpose, one of which he charged with sulphuric acid and common salt, and the other with animal matters. The muriatic acid gas evolved from the one kiln, and the ammonia evolved from the other, he caused to pass separately into a chamber lined with lead, containing a stratum of water on its bottom. The two gases here combined with the formation of sal-ammoniac.

*Ammonia from Guano.*—Mr. Young took out a patent, November 11th, 1841, in which he describes his method of obtaining ammonia from guano. He fills a retort, placed vertically, with a mixture of two parts by weight of guano, and one part by weight of hydrate of lime or other caustic alkali. These substances are thoroughly mixed by giving a rotary or reciprocating motion to the agitator placed in the retort, a moderate degree of heat is then applied, which is gradually increased until the bottom of the retort

becomes red-hot. By this means the ammonia is set free, and the uric acid contained in the guano being decomposed, yields ammonia also. The ammoniacal gas thus given off is absorbed by water in a condenser, whilst other gases, which are given off at the same time, being insoluble in water, pass off. Solutions of carbonate, bicarbonate, or sesquicarbonate of ammonia are produced, by filling the condenser with a solution of ammonia, and passing carbonic acid through it. A solution of sulphate or muriate of ammonia is obtained by filling the condenser with diluted sulphuric or muriatic acid, and passing the ammonia through it as it issues from the retort.

Dr. Wilton Turner took out a patent, March 11, 1844, for obtaining salts of ammonia from guano. The following is his method of obtaining muriate of ammonia in conjunction with cyanogen compounds:—The guano is subjected to destructive distillation in close vessels, at a low red heat during the greater part of the operation; but this temperature is increased towards the end. The products of distillation are collected in a series of Woulfe's bottles, by means of which the gases evolved during the operation may be made to pass two or three times through water, before escaping into the air. These products consist of carbonate of ammonia, hydrocyanic acid, and carburetted hydrogen, the first two of which are rapidly absorbed by the water, with the formation of a strong solution of hydrocyanate and carbonate of ammonia. After the ammoniacal solution has been removed from the Woulfe's apparatus, a solution of protomuriate of iron is added to it, in such quantities as will yield sufficient iron to convert the latter into Prussian blue, which is formed on the addition of muriatic acid in sufficient quantity to neutralize the free ammonia; the precipitate thus formed is now allowed to subside, and is carefully separated from the solution, and by being boiled with a solution of potash or soda, will yield the ferro-cyanate of the alkali, which is obtained by crystallizing in the usual way. The solution (after the removal of the precipitate) should be freed from any excess of iron it may contain, by the careful addition of a fresh portion of the ammoniacal liquor, by which means the oxide of iron will be precipitated, and a neutral solution of [muriate of] ammonia obtained. When the precipitated oxide and cyanide of iron has subsided, the solution of muriate of ammonia is drawn off by a syphon, and the <sup>an</sup> sal-ammo-

niac obtained from it by the usual processes; the oxide of iron is added to the ammoniacal solution next operated upon.

If sulphate of iron and sulphuric acid are used, sulphate of ammonia is the ammoniacal salt produced, the chemical changes and operations being similar to the above. In Doctor Wilton Turner's patent of December 24, 1846, he directs that the urate of ammonia contained in guano be converted into allantoin, oxalic acid and urea. The allantoin is capable of being decomposed into oxalic acid and ammonia, by being boiled with a solution of any caustic alkali or alkaline earth. The oxalic acid unites with the alkali used, whilst the ammonia passes over, and may be collected as liquor ammoniæ. Ammonia may also be obtained from the urea above mentioned, by boiling it in a still with milk of lime, when it is decomposed into carbonic acid, which unites with the lime, and ammonia which passes into the receiver.

In the specification of his patent of August 11, 1846, Mr. Hills describes his mode of obtaining sesquicarbonate of ammonia from guano. To effect this, the guano is first mixed with charcoal or powdered coke, the mixture is then heated, and the sesquicarbonate of ammonia obtained by sublimation.

*Ammonia from Urine.*—Stale urine is also a source of ammonia. The urea of the urine undergoes decomposition, with the formation of ammonia. By the addition of sulphuric or muriatic acid, sulphate or muriate of ammonia may be obtained. It is on account of the ammonia contained in stale urine, that this substance is employed in the scouring of wool and woollen cloth.

*Ammonia from Peat.*—Mr. Hills, in his patent of August 11th, 1846, specified the following method of obtaining ammonia from peat. The peat is placed in an upright furnace and ignited; the air passes through the bars as usual, and the ammonia is collected by passing the products of combustion through a suitable arrangement of apparatus to effect its condensation. This plan of obtaining ammonia from peat appears to be precisely similar to that patented by Mr. Rees Reece (January 23d, 1849,) and made to form an important feature in the operations of the British and Irish Peat Company. The first part of Mr. Reece's patent is for an invention for causing peat to be burned in a furnace by the aid of a blast, so as to obtain inflammable gases and tarry and other products from peat. For this purpose, a blast furnace, with suitable

condensing apparatus, is used. The gases, on their exit from the condensing apparatus, may be collected for use as fuel or otherwise; and the tarry and other products pass into a suitable receiver. The tarry products may be employed to obtain paraffine and oils for lubricating machinery, &c., and the other products may be made available for evolving ammonia, wood spirit, and other matters by any of the existing processes. On the 27th of July, 1849, a statement was made in the House of Commons to the effect that 100 tons of peat would produce 2,602 lbs. of carbonate of ammonia, of the value of £32 10s. 2d., and other products of the value of £59 6s. 6d.; the peat costing £8, and the labor of converting it into these valuable products £8 more. An amended statement afterwards appeared in the Company's prospectus, from which it appeared that 36,500 tons of peat were capable of yielding sufficient ammonia to furnish, with the aid of the requisite quantity of sulphuric acid, 365 tons of sulphate of ammonia. Dr. Hodges, of Belfast, states that in his experiments he obtained nearly 22 $\frac{3}{4}$  lbs. of sulphate of ammonia from a ton of peat. Sir Robert Kane, who was employed by Government to institute a series of experimental researches on the products obtainable from peat, states that he obtained sulphate of ammonia at the rate of twenty-four lbs. and eight-tenths per ton of peat. Messrs. Drew and Stocken patented, in 1846, the obtaining ammonia from peat by distillation in a close vessel, as practised in the carbonization of wood. It will thus be seen that peat is a source of ammonia, but that this source is a profitable or economical one in a commercial point of view, we believe has yet to be determined.

*Ammonia from Schist.*—Another source of ammonia is bituminous schist, which, when submitted to destructive distillation, gives off an ammoniacal liquor, which may be employed in the manufacture of ammoniacal salts by any of the usual processes. The obtaining ammonia from schist forms part of a patent granted to Count de Hompesch, September 4, 1841.—*London Pharmaceuti-Journal*, July, 1853.

(To be continued.)

[A series of papers have been published in the *Pharmaceutical Journal* developing the manufacture of ammonia and its salts; it is designed to publish them in several numbers of the current volume of this *Journal*. The increasing manufacture of coal gas in this country offers the crude materia

for making ammonia, and there is no good reason why the large demand for ammoniacal products should not be supplied at home.—EDITOR AM. JOUR. PHARM.]

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ON CREASOTE.

BY EDWARD N. KENT.

Those who have had occasion to notice the article which has recently been sold under the name of Creasote, have doubtless observed a remarkable difference between it and that formerly sold under the same name. It is well known that creasote was formerly prepared exclusively from wood-tar, and was generally imported from England. The new article is obtained from Germany; and in a recent examination of it, I have found it to be carbolic acid, or hydrated oxide of phenyle, and is consequently prepared from coal-tar. A slip of pine wood, dipped first into this, and then into hydrochloric acid, becomes blue, which is not the case with creasote prepared from wood-tar. In all other qualities it is so similar to creasote as to be scarcely distinguishable from it, except by its less disagreeable use. It is applicable to all uses to which creasote is applied, and, though described by chemists under a different name, I am disposed fully to concur with those who consider carbolic acid to be creasote in a purer form than that obtained from wood-tar.

It is well known that carbolic acid may be easily obtained by agitating the oil produced by the distillation of coal-tar, with a strong solution of caustic alkali, and the subsequent decomposition of the alkaline solution by an acid. But the article thus obtained cannot be purified by any of the processes described in chemical works, so as to remain colorless or compare in purity with that prepared by the German manufacturing chemists. To obtain this desirable result I have devoted much labor; and, as the process has not, to my knowledge, been previously published, will proceed to describe the method of manufacture and purification which has proved successful, with the hope that it may be interesting and profitable to some of our manufacturing chemists, who may be induced to engage in its manufacture.

When coal-tar is subjected to distillation, a small quantity of light oil and water first pass over, but the principle product is a heavy oil, amounting generally to a little more than twenty-five per cent.

of the measure of the tar. The residue is pitch. Carbolic acid, in an impure state, is obtained from the above heavy oil, by agitating it with strong caustic lye; but, as the crude coal oil contains a large percentage of naphthaline and other impurities, I prefer to rectify it and collect the product in two separate portions, the first of which should be used for the preparation of creasote. In this rectification, it is convenient to use twelve parts of the crude heavy oil, distil off eight parts of "rectified oil," change the receiver, and continue the distillation nearly to dryness. The second portion of the distilled product contains an abundance of naphthaline, which is most easily removed by continually using this portion over again in subsequent rectifications, by adding it to more crude oil, sufficient to make twelve parts of another operation. By continually using this crude portion over again, in the above manner, the naphthaline and other impurities are removed, by drawing off the residue remaining in the still at the end of each rectification.

By exhausting the rectified oil with a strong solution of caustic soda, about twenty-five per cent. of carbolic acid is obtained from it. The caustic soda should be as strong and as free from carbonic acid as possible, and for this purpose it cannot be well prepared by the cold process of leeching, which is used by soap manufacturers. I have succeeded best by boiling one pound of soda ash with one gallon of water, and then adding to the boiling solution one pound of hydrate of lime, in small portions at a time, and after boiling fifteen minutes, covering the vessel, and letting it settle till cold. The supernatant lye, decanted off *clear*, is ready for use. A very strong solution of perfectly caustic lye is thus obtained, but if less lime or more water be used, it will not answer well. It is almost impossible to filter the strong lye through the lime residue, but, if it is left until cold, the residue becomes hard and firm, and the lye may then be easily decanted. The lime residue may then be washed with another gallon of water, left to settle, decanted, and this dilute solution used instead of water for making the strong lye in a subsequent operation. The hydrate of lime for the above purpose is best prepared by slacking it with one-third its weight of water, in a vessel loosely covered, and leaving the mixture till the aqueous vapor has combined with a small portion of lime, which would otherwise remain anhydrous.

The best plan for obtaining the creasote is to mix the rectified

oil with an equal measure of the strong caustic lye, stir it occasionally for half a day, draw off the alkaline solution, and again treat the oil in the same manner with half the measure of caustic soda first used. This removes all the creasote contained in the oil, if the lye is good, and in this case a sample of the oil, agitated with a little fresh lye, no longer gives to the latter a dark color. It is best not to heat this mixture, as by so doing the oil becomes rapidly oxidised, and confers a dark color on the alkaline solution, which renders it difficult to be separated. After the first treatment with caustic lye, a large portion of the alkaline compound remains dissolved in the supernatant oil, which renders it necessary to use a second portion of caustic soda to remove it, in the manner above described.

The alkaline solution of creasote (or carboic acid) may be decomposed with almost any acid, but strong sulphuric acid is the most convenient and economical, and this produces a hot solution of sulphate of soda, which becomes a crystalline mass on cooling, while the creasote separates readily to the top, and may easily be removed either before or after the crystallization of the sulphate of soda.

The crude creasote thus obtained is of a light brown color, but soon becomes very dark, and holds water, resin, sulphate of soda, and the substance which becomes brown by oxidation. Of these substances the three first can be removed by distillation, and the last by oxidation and subsequent distillation, but for this purpose a powerful agent must be resorted to. Chromic acid is reduced by it to oxide of chromium, but it is not effectual in perfectly oxidising all of the brown impurity. Nitric acid converts the creasote into carbozotic acid, and consequently cannot be used. Concentrated sulphuric acid answers the purpose admirably, and, in short, this is the only agent which has proved effectual in the purification. For this purpose the acid must be in the most concentrated state, and consequently the crude creasote must first be rectified, to remove water from it, before adding the strong acid, otherwise the latter will become diluted, and less active.

In the rectification of the crude creasote, the first portion which passes over contains water, and should be set aside, to be again separated. When no more water passes over, the rectified product should be collected by itself, in a dry vessel, and the distillation



continued nearly to dryness. The residue should be removed from the still while hot, as it consists of resin and sulphate of soda, which solidifies on cooling. Strong sulphuric acid, in the proportion of one pound to a gallon, is now to be added to the rectified creasote, stirred well, and left till next day. The acid dissolves in the oil, and causes it to become of an orange color ; but, if the oil contains water, the acid becomes diluted, and separates from the oil : hence the necessity of the above precaution in separating the water. Oxidation commences slowly in the cold, and the oil becomes charged with sulphurous acid, but heat is requisite to complete the oxidation of the impurities, although this also decomposes a portion of the creasote. The mixture is therefore to be distilled gently, nearly to dryness, and the residue of resinous matters drawn off while hot. The product is of a yellow color, which is due to its being saturated with sulphurous acid, but by exposure to the air for some time, this is mostly removed, and the creasote becomes of a pale yellow color. In this state it would probably answer for many purposes; but if it is required to be colorless, it is only necessary to wash it with an excess of solution of carbonate of soda, and again rectify it in a glass retort.—*New York Journal of Pharmacy*, Oct. 1853.  
*New York*, September 19th, 1853.

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#### ON CHEMICAL SUBSTITUTES FOR THE FERMENTATION OF BREAD.

Towards the close of the last century Dr. Henry called attention to the fact that, in the fermentation of bread by means of yeast, a loss not only of sugar but of gluten is sustained, and thus a portion of the nutritive substance of the bread is sacrificed in the mechanical operation of raising the dough. He therefore recommended the employment of hydrochloric acid and bicarbonate of soda as a substitute for yeast ; carbonic acid being evolved in the combination of these-substances with the production of common salt, a necessary ingredient in bread. Following out this suggestion of Dr. Henry, Dr. Whiting patented in 1836 a process, which he describes as follows :—To form seven pounds of wheaten flour or meal into bread, mix from 350 to 500 grains of the carbonate of soda with about  $2\frac{3}{4}$  pints of distilled water. Mix with three-quarters of a pint of water separately so much of pure muriatic acid as will neutralize



the quantity of carbonate of soda that is employed, the quantity of the muriatic acid varying according to the known sp. grav. of the same. The flour must be divided into two equal portions; to one portion, which is to be put into a wide earthenware pan or trough, the solution of soda must be gradually poured in, at the same time well stirring and beating the mixture with a large wooden spoon or other suitable instrument, for the purpose of forming a uniform batter, free from all lumps. All pieces adhering to the sides of the pan or spoon must be scraped down into the batter before the mixing is finished. Upon this batter the other portion of the flour is then thrown, and while in the act of briskly stirring them together from the bottom, pour in gradually the diluted muriatic acid, then let the dough be formed, and while in a rough state let it be thrown on the board and lightly kneaded with a biscuit-brake or rolling-pin for a few minutes, doubling and rolling it, it becomes blended and quite uniform and light, care being taken, however, that this process is not continued too long. When this is accomplished the dough may be lightly moulded with dry flour, and baked in middling-sized loaves distinct from each other.

The oven should be hot enough to raise the dough quickly, but not so hot as to bind the crust too soon. The mixing should be conducted in a cool place, and the water used as cold as possible. Common salt should be added to flavor the bread. Great care must always be taken in mixing to secure a perfect union of the acid and alkali, otherwise the bread will be discolored. When eggs, milk, butter, sugar, and spices are to be used in making different kinds of light cakes, the same may be mixed with one portion of the flour before the alkali is added to it, and the dough made as above described. The flour of rye and that of barley and oats, when mixed with some of wheat, may be made into bread in the same manner; if potatoes are used they must on no account exceed one-third by weight of the quantity of flour used. Rice may also be used with wheaten flour, though the best bread is generally made from wheaten flour alone.

Dr. Whiting's process does not appear to have ever been extensively used, but the subject was revived, after the lapse of a few years, by Dr. R. Thomson, who stated, that by the new system, a sack of flour gave a product of 107 loaves instead of 100 loaves, as

on the old method. On the other hand, Frickinger found, by direct experiment on the large scale, that the employment of bicarbonate of soda gave an increase only of  $1\frac{1}{2}$  per cent., whilst the quality of bread was deteriorated.

In 1848 Mr. Sewell, apparently unacquainted with what had been done before, took out a patent for improvements in preparing flour, in which he uses hydrochloric acid and bicarbonate of soda.

In Mr. Sewell's process the flour is placed in a tub or circular vessel, and submitted by suitable mechanical means to the action of hydrochloric acid, which is made to fall (from a series of radial tubes having a bore of about one-hundredth of an inch) in the form of a finely divided shower, on the flour, fresh surfaces of which are constantly exposed to the falling acid. By this means about forty-five ounces avoirdupois weight of hydrochloric acid of the sp. grav. 1.14, which contains about twenty-eight per cent. of real acid, are incorporated with each 280 lbs. of flour, the mixture being afterwards sifted through a fine sieve, put it into flour-barrels or other receivers, and is ready for sale. Thus a preparation of flour is produced, ready to be combined with other ingredients mentioned, which will render it suitable to be made into bread without the use of yeast. The flour thus prepared, the patentee terms the preparation No. 1, because it admits of being kept for a longer period before it is used than the preparation No. 2, which is produced as follows:—Take of good dry flour 280 lbs. avoirdupois weight, and pursue the same course of operations as with No. 1, up to the point at which the hydrochloric acid is thoroughly incorporated with the flour, as before described; but instead of stopping the agitation of that point, it is continued until there is sifted into and thoroughly incorporated with the mixture of flour and hydrochloric acid about thirty-nine ounces avoirdupois weight of bicarbonate of soda in a state of fine powder, at which stage any other ingredients known to improve the appearance and flavor of bread may also be added (when such addition is thought desirable), according to the taste of the consumer. When the mixture is completed, the whole is passed through a fine sieve, put it into flour-barrels or other receptacles, and is ready for sale or use.

To make preparation No. 1 into bread (which should be done within about five weeks from the time it is produced), all that is required is, to mix intimately with each pound weight to be used,

sixty-three grains of bicarbonate of soda, in a state of fine powder, in which state also may be added (according to the taste of the consumer) a portion of culinary salt, sugar, or any other ingredient known to improve the appearance and flavor of bread. After the mixture is completed, it must be kneaded well and actively with cold water; it may then be put into the oven, either immediately, or, if kept cold, any time within an hour or two.

To make preparation No. 2 into bread (which should be done within four weeks from the time it is produced), all that is requisite is to knead it well and actively with cold water; it may then be put into the oven, either immediately, or, if kept cold, at any time within an hour or two.

Another chemical substitute for fermented bread is the prepared flour patented by Mr. Jones, and which meets with an extensive demand at the present day.

Jones's patent flour is prepared as follows:—Take wheat or other grain, from which the flour to be prepared is made, of fine quality, perfectly dry, or make it so by passing it over a kiln. After grinding and dressing it, it should be allowed to remain to ripen for a month or six weeks; then into one cwt. of it put  $10\frac{1}{2}$  oz. (avoirdupois) of tartaric acid of the finest quality, and as dry as possible, and which has passed through a very fine sieve; mix it well with the flour, and pass it through a flour-dressing machine, and allow it to remain untouched for two or three days, that the water of crystallization, always more or less present in the tartaric acid, may be absorbed by the flour, and so form around the particles of acid a coating of flour that will prevent its immediate contact with the particles of alkali, and thereby prevent their mutual decomposition; afterwards mix with the quantity of flour and acid before named, twelve oz. of bicarbonate of soda in fine powder, twenty-four oz. of muriate of soda or common salt, fine and dry, and eight oz. of loaf sugar in fine powder; mix the whole thoroughly together, then put the whole mixture through a flour-dressing machine, when it will be ready for use. The quantities of acid and alkali may have to be slightly varied according to their quality, but the point to be attained is the neutralization of both. Other articles, such as bicarbonate of potassa and citric acid will make excellent bread, but are in general too expensive. The prepared flour when used to make bread, biscuits, &c., only requires to be made into dough

with water, in the proportion of ten oz. of water to one lb. of flour for bread, and six oz. of water to one lb. of flour for biscuits, and to be baked at once in a well-heated oven. Carbonate of ammonia, either alone or in combination with tartaric acid, is also employed in making bread, cakes, &c., but great attention is necessary to obtain such a gradual and continuous evolution of carbonic acid gas as will prevent the bread sinking again before it is placed in the oven. A mixture of carbonate of ammonia and alum answers well, the only objection to its use arising from the alum remaining in the bread. In all cases in which ammoniacal salts are employed it is generally found difficult to expel them completely from the bread, which is thus apt to acquire a disagreeable taste.

The composition of egg or baking powder is as follows:—Carbonate of soda fifty-six lbs.; tartaric acid twenty-eight lbs.; potato-flour one cwt.; turmeric powder three-quarters of a lb.—*Pharmaceutical Journal*, Oct. 1853.

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PATENT GRANTED TO WILLIAM EDWARD NEWTON, FOR IMPROVEMENTS IN THE MANUFACTURE OF CARBONATES OF SODA.

In carrying out his improvements, the inventor takes sulphate of soda, as obtained by any of the known processes, and reduces it to a coarse powder; and with this he mixes about one-half its weight, more or less, of powdered coal, charcoal, sawdust, or other combustible matter. This mixture is subjected to a low red heat, in a suitable furnace, until the mass is melted, and thoroughly decomposed into sulphuret of sodium. It is then withdrawn from the furnace, and, when cool enough, dissolved in water, and run into suitable air-tight vats, provided with pipes and stop-cocks, and connected with each other in the manner known among chemists as Woulf's apparatus; which vats, for greater convenience, are placed one above another. By an air-pump, or other suitable means, carbonic acid is then transmitted through the liquid in the series of vats, entering the lower ones first. It is preferred that this carbonic acid should be obtained from the escape gases from chimneys, or other parts of furnaces burning anthracite or other mineral coal, and especially from the chimneys of steam-boilers. The gases are first passed through

water in a suitable vessel, to remove ashes, smoke, or other dirt ; a little lime, carbonate of lime, or alkaline matter being mixed with the water in the said vessel, to absorb and remove any sulphurous acid, the presence of which would injure both apparatus and materials. It is found in practice that 1 lb. of lime is sufficient for 10,000 cubic feet of gas.

The carbonic acid is transmitted through the liquid in the vats until the decomposition of sulphuret of sodium into carbonate of soda is found in the lower vat to be complete, which is easily known by suitable chemical tests, when it may be drawn off to be filtered and evaporated in the usual manner. The liquor in the upper vat is then to be brought into the lower one, and fresh liquor into the upper one, and the process repeated as before.

The patentee remarks, that any arrangement of apparatus may be used that will bring carbonic acid into intimate contact with sulphuret of sodium.

During the whole process a constant stream of gases is escaping from a pipe in the upper vat, consisting of sulphuretted hydrogen, nitrogen, and other gases. The whole of the sulphur originally in the sulphate of soda is contained in the sulphuretted hydrogen, which may be recovered, or made into compounds of sulphur by means well known to chemists.

If bicarbonate of soda, or "soda-salaratus" as it is called when impure, is to be made, the solution of carbonate of soda, obtained from the vats wherein the sulphuret of sodium is converted into carbonate by means of carbonic acid, as previously described, is filtered and boiled down until the carbonate of soda separates from the liquor as a crystalline powder, consisting of 1 equiv. of real carbonate of soda united with 1 equiv. of water ; or, if thought desirable, commercial soda-ash or sal-soda may be dissolved in water, and substituted for the solution spoken of above. The powder of carbonate of soda, above mentioned, is ladled out of the liquor, drained, and allowed to cool. This is coarsely powdered and spread upon frames, which are piled one upon another in air-tight chambers. When the chambers are full, the openings are closed, except a vent at the top ; and carbonic acid, by preference, obtained and purified, as mentioned in the preparation of soda-ash, is forced into them until the saturation is complete ; when the soda will be found to have absorbed

a second equivalent of carbonic acid, forming a bicarbonate of soda or soda-salaratus, when not pure. The bicarbonate of soda is then taken out, dried and powdered.—Sealed Nov. 8, 1852.—*Chem. Gazette*, Sept. 15, 1853.

[This process, thus secured in England by letters Patent, is that of Mr. Henry Pemberton, of Philadelphia, who had previously obtained a patent for it here. Should the process be so far perfected, as to render the sulphur, which escapes as sulphuretted hydrogen, available, in a free state, the value of the patent will be greatly increased, and a present objection to its application will be removed.—EDITOR AM. JOUR. PHARM.]

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#### NEW METHODS FOR MANUFACTURING PURE ACETIC ACID.

The decomposition of acetate of lime or lead by means of sulphuric acid has many inconveniences, and there is danger of the product being contaminated with sulphuric acid. Christl was therefore induced to employ hydrochloric acid as a decomposing agent, and has found that when this acid is not used in excess, the distillate contains scarcely an appreciable trace of chlorine. A mixture of 100 lbs. of raw acetate of lime obtained from the distillation of wood, and containing 90 per cent. of neutral acetate, with 120 lbs. of hydrochloric acid (20° Baumé), is allowed to stand during a night, and then distilled in a copper vessel. The application of heat requires to be gradual, in order to prevent the somewhat thick liquor from running over. The product of acetic acid amounted to 100 lbs. of 8° Baumé; it had a faint yellow color and empyreumatic odor, which may be perfectly removed by treatment with wood-charcoal and subsequent rectification.

In order to obtain the acetate of lime sufficiently pure, Völckel adopts the following process:—The raw pyroligneous acid is saturated with lime without previous distillation. A part of the resinous substances dissolved in the acid are thus separated in combination with lime. The solution of impure acetate of lime is either allowed to stand until it becomes clear or filtered,\* then evaporated in an iron pan to about one-half, and hydrochloric acid added until a drop of the cooled liquid distinctly reddens litmus-paper. The addition of acid serves to separate a great part of the resin still held in solution, which collects together in the boiling

\* A part is distilled off in a copper still in order to obtain wood-spirit.

liquid, and may be skimmed off, and likewise decomposes the compounds of lime with kreosote and some other imperfectly known volatile substances, which are driven off by further evaporation. As these volatile substances have little or no action upon litmus-paper, its being reddened by the liquor is a sign that not only are the lime compounds of these substances decomposed, but also a small quantity of acetate of lime. The quantity of acid necessary for this purpose varies and depends upon the nature of the pyroligneous acid, which is again dependent upon the quantity of water in the wood from which it is obtained. 150 litres of wood liquor require from 4 to 6 lbs. of hydrochloric acid.

The solution of acetate of lime is evaporated to dryness, and a tolerably strong heat applied at last, in order to remove all volatile substances. Both operations may be performed in the same iron pans, but when the quantity of salt is large, the latter may be more advantageously effected upon cast iron plates. The drying of the salt requires very great care, for the empyreumatic substances adhere very strongly the acetate of lime, as well as to the compound of resin and acetic acid mixed with it, and when not perfectly separated, pass over with the acetic acid in the subsequent distillation with an acid communicating to it a disagreeable odor. The drying must therefore be continued until upon cooling the acetate does not smell at all, or but very slightly. It then has a dirty brown color. The acetic acid is obtained by distillation with hydrochloric acid in a still with a copper head and leaden condenser; when proper precautions are taken, the acetic acid does not contain a trace of either metal. The quantity of hydrochloric acid required cannot be exactly stated, because the acetate of lime is mixed with resin, and already formed chloride of calcium. In most instances 90 or 95 parts by weight of acid, 1.16 spec. grav., are sufficiently to decompose completely 100 parts of the salt, without introducing much hydrochloric acid into the distillate.

The distilled acetic acid possesses only a very faint empyreumatic odor, very different from that of the raw pyroligneous acid; it is perfectly colorless, and should only become slightly turbid on the addition of nitrate of silver. If the acid has a yellowish color, this is owing to resin having been spirited over in the distillation. It is therefore advisable to remove the resin which is separated on the addition of hydrochloric acid, and floats upon the surface of the liquid



either by skimming or filtration through a linen cloth. The distilled acid has a specific gravity ranging between 1.058 and 1.061, containing upwards of 40 per cent. of anhydrous acetic acid. It is rarely that acid of this strength is required; and as the distillation is easier when the mixture is less concentrated, water may be added before or towards the end of the distillation. Völckel recommends as convenient proportions—

100 parts acetate of lime,  
90 to 95 hydrochloric acid,  
25 parts water,

which yield from 95 to 100 parts of acetic acid of 1.105 spec. grav. 150 litres of raw pyroligneous acid yield about 50 lbs. of acetic acid of the above specific gravity.

The acid prepared in this way may be still further purified by adding a small quantity of carbonate of soda and redistilling; it is thus rendered quite free from chlorine, and any remaining trace of color is likewise removed. The slight empyreumatic smell may be removed by distilling the acid with about two or three per cent. of acid chromate of potash. Oxide of manganese is less efficacious as a purifying agent.

Although pure acetic acid may be procured by the distillation of vinegar, the whole of the acid cannot be obtained except by distilling to dryness, by which means the extractive substances are burnt, and the distillate rendered impure. In order to obviate this difficulty Stein proposes to add 30 lbs. of salt to every 100 lbs. of vinegar; the boiling point is thus raised, and the acid passes over completely.—*Chemical Gazette*.

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ON THE CINCHONAS, AND THE QUESTIONS WHICH, IN THE PRESENT STATE OF SCIENCE AND COMMERCE ARE MORE IMMEDIATELY CONNECTED WITH THEM.

By MM. A. DELONDRE AND BOUCHARDAT.

*Rolled Cinchona Calisaya*.—Very thick epidermis, rough, uneven, marked at distances with annular fissures, and, in the intermediate space, with transverse and longitudinal cracks, more or less close to each other, often anastomosed, of a silvery or greyish white. Internal face, purely fibrous, of a yellow fawn, even tex-



ture ; very clear transverse fracture, externally very resinous, with short fibres internally.

These barks are produced, as we have before observed, by the branches of the tree whose trunk gives the flat bark. Less alkalioid is procured from them than from the former, and, in accordance with the size of the bark, the produce varies from 15 to 20 grammes of sulphate of quinine, and from 8 to 10 grammes of sulphate of cinchonine per kilogramme.

*Cinchona Carabaya*.—This bark comes from the province of Carabaya, by Arequipa, to the ports of Islay, and sometimes of Arica ; the thickness is from 2 to 3 millimetres in the bulk of the serons, which are, the same as the above, of the weight of 72 to 75 kilogrammes.

The internal surface is of a very even texture, but very brown, and often contorted by desiccation. The external surface, instead of longitudinal ridges, is covered with small, almost black points, which are formed by the adherence of the epidermis, and sometimes in slanting ridges. The transverse fracture is clear, fibrous within, with a resinous layer outside. It sometimes comes in very small pieces, producing scarcely 12 grammes of sulphate of quinine ; but when the thickness we have mentioned is taken as the average, 15 to 18 grammes of sulphate of quinine, and 4 to 5 grammes of sulphate of cinchonine may be obtained.

*Columbian Cinchonas*.—The cinchona pitaya, which M. O. Henri has proved to be so rich in febrifuge alkaloids, has more especially retained the name of Columbian cinchona.

What is to be understood by Columbian cinchonas ? It is evident that so general a term can have no precise meaning. Carthagena is a port of New Granada ; all the cinchonas which bear the name of Carthagena cinchonas, are, therefore, Columbian cinchonas, for New Granada is a portion of Columbia. All the cinchonas which Mutis has discovered in New Granada are likewise Columbian cinchonas.

*Cinchonas known in Commerce as Carthagena cinchonas*.—There are several species found in the forests of New Granada, and sent to Europe from the ports of Carthagena, Saint Martha, and Maracaybo, in serons of from 50 to 55 kilogrammes.

We owe the discovery of all these cinchonas to Senor Mutis, a Spanish medical man.

We cannot read the following lines in M. Guibourt's *Histoire Naturelle des Drogues Simples*, without astonishment :

“ A man who has acquired a great reputation as the discoverer of cinchonas, but who has only helped to fill the history of these barks with confusion and obscurity, is Mutis, a Spanish botanist, who started in 1760 for New Granada,\* where he remained, and whom the desire of making a reputation at the expense of the Flora of Peru, has caused to commit errors which are found in all recently published works on this subject. To justify this *severe judgment*, it will suffice for me to say that Mutis, who could not help knowing the real Peruvian cinchonas, has given their names to quite different and *almost valueless* barks growing at Santa Fe. Thus his vaunted *orange cinchona* is only a very fibrous kind of Calisaya of very bad quality. His *red cinchona*, the bark of his *cinchona oblongifolia*, is only the *bad bark*, since named *cinchona nova*. His *yellow cinchona*, different from that of La Condamine, and produced by his *cinchona cordifolia*, is what we now call *cinchona Carthagena*.”

After this violent diatribe against the eminent man, whose great merit was recognised by all his contemporaries, we turn with pleasure to the striking justice which Linnæus renders to Mutis: *Nomen immutabile quod nulla ætus unquam delebit!*

We may also cite the testimony of those celebrated men Humboldt and Bonpland, who went through the same forests after him, and have confirmed all his observations, whose truth is even more strongly shown when we consider the richness in alkaloids which characterizes the cinchonas of New Granada.

Yes ! the name of Mutis is as imperishable for his discoveries of cinchonas, as the names of Pelletier and Caventou are for the discovery of the sulphate of quinine.

*Orange Yellow Cinchona of Mutis.*—The internal surface this bark is of a rather red orange yellow ; the thickness is from 2 to 8 millimetres on the average of the serons, the texture is uniform, like the cinchona calisaya, but not so close, and with longer fibres. The external surface is nearly smooth, and of a redder yellow than the inside, sometimes marked transversely with whitish traces of the very thin epidermis which was on it. Transverse

\* He died there in 1808.

fracture, woody internally, and suberous externally. A fresh bitterness, similar to that of the calisaya, slightly styptic, very persistent and rather aromatic. The barks which are thinner and almost always rolled, found in the serons mixed with the larger barks, differ neither in bitterness or color ; but if treated separately, less alkaloid will be obtained.

The whole together produces 15 to 16 grammes of sulphate of quinine, and from 6 to 8 grammes of sulphate of cinchonine per kilogramme : 1 gramme of these sulphates gives the same quantity of bitannate as those of calisaya with tannin or an infusion of nut galls.

M. Delondre sent a very large sample to M. Guibourt some months ago, that he might convince himself by his own analysis of the error into which he had fallen respecting this cinchona.

*Yellow Cinchona of Mutis.*—This cinchona presents at the first view the same characters as the preceding, but the internal color is of a yellow ochre color, the texture is less united, and sometimes with rather deep longitudinal furrows, especially the larger barks. The surface is more or less wrinkled, of a duller yellow, with more whitish traces of epidermis, and in some places with crusts, which are easily removed, and which leave deep hollows.

The bitter is slightly acid and more styptic than that of the orange yellow. The product is from 12 to 14 grammes of sulphate of quinine, and from 5 to 6 grammes of sulphate of cinchonine per kilogramme.

According to M. Delondre's experiments, the peculiar crystallization to which he, in conjunction with M. O. Henri, gave in 1833, the name of quinidine is obtained with greater ease from this sulphate of quinine than from others, although in small quantity ; this substance has been again examined of late, notwithstanding the observations published by them in 1831, to prove that this crystallization is due to a state of hydration of the quinine.

*Red Cinchona of Mutis.*—The barks of this cinchona are from 2 to 15 millimetres in thickness in the bulk of the serons. Internally, the color is of a reddish brown, the texture is very close, with some deep longitudinal furrows in the thick barks. The exterior is of a lighter red, even and spongy, covered in some places with a light epidermis, of a dull white, very adherent, and in some parts with crusts, which are easily detached, and leave deep hol-

lows, as in the preceding cinchona. Transverse fracture, slightly rose-colored, with fine fibres internally and suberous externally. The bitter develops itself easily and is persistent, but without the slightly aromatic taste peculiar to the orange yellow.

The internal surface of the young barks which are rolled does not differ in color; the texture is finer and the exterior more rugged, and sometimes in ridges.

This is the cinchona which comes over in the smallest quantity from New Granada. From 12 to 14 grammes of sulphate of quinine, and from 6 to 7 grammes of sulphate of cinchonine may be extracted from it. The same results are obtained by tannin and nut galls as from the other species. The sulphate of quinine produced from this cinchona furnishes with greater ease and quantity, according to the experiments of M. Delondre, the peculiar crystallization which he considers a special state of sulphate of quinine.

According to the experiments of MM. Delondre and Henri, this sulphate of quinine is completely soluble in 60 parts of sulphuric ether and 60 parts of ammonia for one part, by the old process of M. Liebig. Whereas the sulphate of quinine proceeding from the cinchonas calisaya, carabaya, and orange yellow of Mutis, are completely soluble in 8 parts of ether and 2 parts of ammonia, using the modification of the same process proposed by MM. Bussy and Guibourt in the *Journal de Pharmacie*, December, 1852.

One gramme of sulphate of quinine in these last conditions was dissolved in alcohol at  $36^{\circ}$ , with heat, and filtered, 2 grammes of ammonia were then added, it was then mixed with pure water until *lactescence* was produced; crystallization had commenced at the close of thirty-six hours, and had not become very distinct for several days. The sulphate proceeding from the yellow and red cinchonas of Mutis, treated in the same manner, furnished this crystallization after some hours repose, under the form of small laminæ.

The difference of these sulphates, then, consists, according to MM. Delondre and Henri, in the greater or less promptitude with which this peculiar crystallisation is formed.

M. Delondre insists on these details because it was on the occasion of having to manufacture a lot of two hundred serons of this cinchona that the conflict between quinine and quinidine arose, which has been already mentioned.

M. Bussy wished him to recall his old labors with M. Ossian Henri, so as to give value to this product as a substitute for sulphate of quinine, and, perhaps, he said, as preferable in some cases. Notwithstanding this proof of his affection for him, M. Delondre persisted in his conviction that there was nothing either new or useful in the results which he had just obtained, for if the peculiar crystallization (called *quinidine*) were to be separated, the prices would be exorbitant. The surest and most economical substitute for sulphate of quinine is cinchonine, which is naturally united to quinine in all cinchonas, and which is only separated from it by the chemical operations. Moreover, its sulphate is worth 5 francs for 30 grammes, whereas the price of sulphate of quinine is from 14 to 15 francs; and for more than a century those cinchonas have been preferred which contain chiefly cinchonine.

M. Delondre has likewise given a large sample of this red cinchona to MM. Bussy and Guibourt, because it has been hitherto but little known, and is still very rare.

It is difficult to appreciate the value of this cinchona, for in the works on this subject, it is confounded with the bark, improperly called *china nova*, and which is not a cinchona at all, as we shall prove hereafter.—*N. Y. Journal of Pharmacy*, Aug. 1853, from *Repertoire de Pharmacie*, March, 1853.

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ON THE TRANSFORMATION OF TARTARIC ACID INTO RACEMIC ACID, THE DISCOVERY OF INACTIVE TARTARIC ACID, AND A NEW METHOD OF SEPARATING RACEMIC ACID INTO DEXTRO- AND LÆVO-TARTARIC ACIDS.

By L. PASTEUR.

In a memoir recently presented by me to the Academy of Sciences\*, I showed that all the salts of cinchonine, of quinine, of quinidine and of cinchonidine, when submitted to the action of heat, were capable of being converted into salts of quinicine and cinchonine, two new organic bases, isomeric respectively with quinine and quinidine, and with cinchonine and cinchonidine. If, in the study of these isomeric metamorphoses, the tartrates of these alkalies be employed, and the action of heat be carried far beyond the point

\* See Vol. XXV. page 534 Am. Jour. Pharm.

at which cinchonine and quinine are produced, the modifying influence of the heat is exerted upon the tartaric acid itself. Thus tartrate of cinchonine, submitted to a gradually-increasing temperature, becomes first of all converted into tartrate of cinchonine. When the heat is continued, the cinchonine becomes changed; it loses water, acquires a color, and becomes converted into quinoidine. The tartaric acid also undergoes important modifications, and after five or six hours' exposure to a heat of  $338^{\circ}$  F., a portion of it has been changed into racemic acid. The vessel is then broken, and the black resinous mass contained in it treated repeatedly with boiling water; the liquid is filtered after cooling, and chloride of calcium added to it in excess, by which all the racemic acid is immediately precipitated in the form of racemate of lime, from which the racemic acid is readily extracted.

The principal part played by the cinchonine in this operation, is to give a little stability to the tartaric acid, and to enable it to support, without destruction, a temperature which would change it rapidly in a free state. Cinchonine and cinchonine, although they are substances which act upon polarized light, play no part in this transformation. Tartaric ether, for example, in which tartaric acid is in combination with an inactive body, which is capable of supporting an elevated temperature without destruction, furnishes considerable quantities of racemic acid by the action of heat.

The racemic acid thus artificially obtained is completely identical both in its physical and chemical properties, with natural racemic acid. It especially possesses the important character of being capable of resolution into dextro- and lævo-tartaric acids, exhibiting equal rotatory powers in opposite directions in their combinations with bases.

This resolution of artificial racemic acid into dextro- and lævo-tartaric acids, leads us to this result,—that ordinary dextro-tartaric acid may be artificially converted into its opposite, lævo-tartaric acid; a result which is particularly remarkable in connexion with this extraordinary fact, which will no doubt be explained some day, that a product with an active polarity has never under any circumstances been obtained by starting from an inactive substance, although nearly all the substances elaborated by nature in the vegetable organism are dissymmetric in the same manner as tartaric acid. What gives to this fact of the transformation of dextro-tar-

tartic acid a particular originality is, that I have ascertained that in the same circumstances lævo-tartaric acid also becomes converted into racemic acid. What a strange tendency is exhibited by these natural organic bodies ! a totality of dissymmetric dextro- or lævo-molecules becoming half transformed, simply by the influence of an elevated temperature, into inverse molecules, which, when once produced, combine with the first.

During a long period I had regarded the production of racemic acid from tartaric acid as impossible. In fact I supposed that racemic acid was a combination of lævo-tartaric acid with dextro-tartaric acid. The conversion of dextro-tartaric acid into racemic acid is consequently of the same nature as that of the transformation of dextro-tartaric acid into lævo-tartaric acid. Now all that can be done with the dextro-tartaric acid can be effected under the same circumstances with the lævo-tartaric acid. If, therefore, any operation performed with the dextro- acid changed its direction of rotation to the left, the same operation performed with the lævo-tartaric acid would render it right. The transformation therefore appears impossible ; at the most we may arrive at an inactive acid.

Fortunately experiment has contradicted these theoretical deductions. However, they served me as guides ; and the less I was disposed to seek for the conversion of tartaric acid into racemic acid, the more I endeavored to produce inactive tartaric acid. Not only did the existence of this acid appear to me to be theoretically possible, but I also know the intimate connexion between tartaric and malic acids, and I had already obtained inactive malic acid. Now it is in seeking for inactive tartaric acid that I ascertained the convertibility of tartaric acid into racemic acid. But the same operation, fortunately and singularly, furnished me also with considerable quantities of inactive tartaric acid. In other words, I have obtained, together with racemic acid, a tartaric acid which has no action upon polarized light, and which is moreover capable of being resolved, under the same circumstances as racemic acid, into dextro- and lævo-tartaric acids ; an extremely curious acid, crystallizing readily, and giving salts which yield neither to the tartrates nor to the racemates in beauty or form. I have already said, that after treating tartrate of cinchonine, which had been exposed for several hours to a heat of  $338^{\circ}$  F., with water, and add-



ing chloride of calcium to the liquid, the racemic acid formed at the expense of tartaric acid is precipitated in the form of racemate of lime. If the liquid be immediately filtered to separate the racemate, a fresh crystallization is deposited in about twenty-four hours; this consists of pure inactive tartrate of lime, from which the inactive tartaric acid may be readily extracted.

Lastly, I have ascertained that the inactive tartaric acid is produced in the preceding operation entirely at the expense of the racemic acid already formed. This is proved by the fact, that if racemate of cinchonine be kept at a temperature of  $338^{\circ}$  F. for several hours, a considerable portion of it is converted into this inactive tartaric acid.

We consequently now know four tartaric acids,—dextro-tartaric acid; lævo-tartaric acid; the combination of both, or racemic acid; and the inactive acid, which deviates neither to the right nor left, nor is formed by the combination of the dextro- and lævo-tartaric acids. There is no doubt that this series of four isomeric tartaric acids is a type round which a multitude of others will range hereafter.

There is, however, a serious difficulty to be found in the ulterior applications of these new results. Thus, to pass from dextro-tartaric acid to lævo-tartaric acid, it is necessary to pass through the racemic acid, which is a combination of the two, and to split this combination. For this purpose I proposed the formation of the double salt of soda and ammonia. The crystals produced are of two sorts; these I separated by hand according to the character of their hemihedric form. This splitting is here accidental. It is no doubt a very curious phenomenon, for which however we see no proximate cause; besides, it is only one racemate that presents this faculty of splitting; consequently a new racemic acid might be obtained in some other series than the tartaric series, which probably it might be found impossible to resolve, and the inverse of the product started from to obtain it would remain unknown. This was until lately the state of the question; but I have recently found a chemical process, resting on general principles, for the resolution of racemic acid.

In a former memoir, I showed that the absolute identity of the physical and chemical properties of non-superposable right and left bodies ceased to exist when the seproducts were placed in



the presence of active bodies. Thus the dextro- and lævo-tartrates of the same active organic alkali are quite distinct in crystalline form, solubility, &c. It was to be hoped, therefore, that we might profit by this dissimilarity to isolate the two acids composing racemic acid; and for this purpose, after many fruitless researches, I have found means to render the two bases quinine and cinchonine serviceable. When racemate of cinchonine is prepared, and its solution brought to a certain state of concentration, it always happens that the first crystallization is principally formed of lævo-tartrate of cinchonine, the dextro-tartrate remaining in the mother-liquor. A similar result is presented with quinine, only that in this case the dextro-tartrate is the first deposited. When, therefore, it is supposed that an organic product possesses a binary constitution analogous to that of racemic acid, its resolution should be attempted by placing it in contact with an active product, which, by the necessarily dissimilar properties of the combinations which it is capable of forming with the components of the complex group, will render the separation of the latter possible.—*London Chem. Gazette*, Nov. 1, 1853, from *Comptes Rendus*, August 1, 1853, p. 162.

#### ON THE FORMATION OF SALICYLIC ACID IN THE BLOSSOMS OF SPIRÆA ULMARIA.\*

By L. A. BUCHNER.

Although Piria has long since shown that salicin, under the influence of oxidizing agents, gives rise to salicylic acid, it was not certain that this substance originated in the same manner in the blossoms of the *spiræa*. Recent experiments of the author have rendered it probable that these blossoms when young contain salicin.

The flower buds of this plant have scarcely any smell, and consequently cannot contain more than mere traces of salicylic

\* [The term "Salicylic" is used incorrectly in this and the following paper; it should be "Salicylous." Salicylous acid is the oil of *Spirea ulmaria*, and it is the substance obtained by distilling salicin with sulphuric acid and bichromate of potassa. *Salicylic* acid is obtained from this oil by the action of caustic potassa, and is an odorless crystalline substance like pure benzoic acid.—EDITOR AM. JOUR. PHARM.]

acid. Their taste is balsamic, astringent, bitter, resembling willow bark. When the flowers are distilled a small quantity of salicylic acid passes over, but the residue yields a fresh quantity of the acid when treated with bichromate of potash and sulphuric acid, as would be the case if they contain salicin.

The author then extracted the flower buds with boiling water, treated the liquid with neutral and afterwards with basic acetate of lead. Both salts produced bright yellow precipitates, the quantity of that produced by the former salt being much the largest.

The colorless liquid left after perfect precipitation and filtering was freed from lead by sulphuretted hydrogen and evaporated. A brownish very sweet and bitter syrupy residue remained, which dissolved partially in alcohol. This alcoholic solution left on evaporation an amorphous viscous mass with a persistent bitter taste; with concentrated sulphuric acid it gave a red color; by distillation with bichromate of potash and dilute sulphuric acid it yielded besides formic acid oily drops of salicylic acid. Even after standing for a year the syrupy liquid furnished no crystals of salicine, doubtless on account of the preponderating quantity of amorphous sugar present.

It follows, therefore, from these reactions and others which were tried, that the salicylic acid generated in the development of the bud to the flower originates from salicine.

The two lead precipitates above mentioned appear to contain the same organic substances, probably citric acid and a variety of tannin.—*London Pharmaceutical Journal*, from *Neues Repertorium für Pharmacie*, 1853.

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## CONTRIBUTIONS TO THE PHYSIOLOGY OF THE SPIRACEÆ.

By W. WICKE.

The above experiments of Buchner acquire an especial interest from the following observations of Wicke. He finds that salicylic acid, or at least the substance from which it is produced, is very generally present in the members of the family spiracæ and in the various organs; and, secondly, that the shrubby spiracæ, which are evidently more closely allied to the pomacæ than the herbaceous members of the former family, contain amygdalin.

Thus the distillate obtained from the herbaceous spiracæ, gathered in June, contains salicylic acid and no hydrocyanic acid, while that of the shrubby plants contains hydrocyanic and no salicylic acid. The distillates from the leaves and roots of *sp. ulmaria* from the entire plant of *sp. digitata*, *sp. lobata*, *sp. filipendula*, contain salicylic acid. The distillates from *sp. aruncus*, *sp. sorbifolia*, *sp. japonica*, contain hydrocyanic acid. Neither of these acids are found in the distillates from *sp. levigata*, *sp. acutifolia*, *sp. ulmifolia*, or *sp. spulifolia*.

The author directs attention to the fact that the leaves of *sp. sorbifolia* and those of *sp. aucuparia* are remarkably similar, and that the leaves of *sp. aruncus*, which are of a very complex kind, have the same typical character of form. On comparing the leaves of *sp. filipendula* and of *sp. ulmaria* with those of the above named members of this family the analogy in form is obvious.

The other two herbaceous spiracæ, *sp. lobata* and *sp. digitata*, are characterized by a more simple form of leaf; but this may be assumed to be the fundamental form of the more complex leaves. These herbaceous spiracæ are further chemically characterized by the fact that on distillation with water they yield salicylic acid.

If, then, the assumption is correct that the salicylic acid found originates from salicin and the hydrocyanic acid from amygdalin, the occurrence of these two substances in this family is a fact worthy of attention, for both of them are conjugate compounds containing a sugar. Both suffer this remarkable change in contact with emulsine. Salicin splits up into saligenin and sugar; amygdalin into hydrocyanic acid, hydruret of benzoyle, and sugar. Saligenin, by assimilating two equiv. of oxygen and separation of two equiv. of hydrogen, passes into salicylic acid, which may be thus directly formed from salicin. But further, salicylic acid is isomeric with benzoic acid, which is formed from hydruret of benzoyle by the assimilation of two equiv. of oxygen. Again, saliretin is isomeric with hydruret of benzoyle, which is formed from saligenin by the separation of two equiv. of water.

This relation which appears to exist between the structure of the plants and the chemical substances which occur in them, the author proposes to express by the term "isomorphism of organic nature," regarding here instead of the actual replacement of one

atom by another the similarity of physiological agency, and instead of similar crystal-form analogous structure of the plants.—*London Pharmaceutical Journal*, from *Annalen der Chemie und Pharmacie*.

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## WERE THE ANCIENT EGYPTIANS ACQUAINTED WITH NITRIC ACID?

By THORNTON J. HERAPATH, Esq.

In the supplement number of the "Philosophical Magazine" for July last, my father published a paper on "Early Egyptian Chemistry," in which he gave a short account of some experiments he had made on certain hieroglyphical marks that had been discovered on the wrappers of a mummy which was recently unrolled by Mr. Nash at the Bristol Microscopical Society; and he then stated it was his belief that the ancient Egyptians were acquainted with a marking fluid containing nitrate of silver for its basis, and were also familiar with the use of nitric acid. A short time afterwards Mr. Denham Smith, in reply to this letter, took exception to my father's views on the subject; and whilst admitting the interesting nature of the discovery that had been made of an argentine solution having been employed some three thousand years ago as "marking ink," totally dissented from the conclusions that had been founded on it, inasmuch, he said, as there was no evidence to prove that the Egyptians were even acquainted with the art of distillations. He also hazarded the opinion, unsupported, however, by direct evidence, that the marking fluid in question was prepared—if I understand him aright—by dissolving either chloride or oxide of silver in an ammoniacal solution, and consequently without the intervention of any acid whatever. As the question in dispute is one of considerable interest in a scientific point of view, I determined to subject the marks to a fresh examination. After making several preliminary experiments, I found that no results of any value could be obtained by the ordinary modes of analysis, and was therefore compelled, as a last resource, to call in the assistance of the microscope.

Upon examining some of the fibres of the bandages that were stained by the argentine ink, I found them to present a very pe-

culiar appearance. The ends nearest the corroded parts of the fabric were stained of a deep brown or black; but for some little distance beyond the blackened portion the fibre was colored of a pale yellow hue, as if, during the decomposition of the silver salt that had been employed as "marking-ink," the nitrogenous constituents of the tissue had been partially acted upon and converted into xanthoproteic acid.

Between several of the fibres, and in many places adhering to their external surfaces, were found small particles of some organic tissue, which were colored of a still deeper yellow than the fibres themselves. On subjecting some of the latter to the action of strong *liquor ammoniac*, the yellow portions, particularly the altered intercellular substance, acquired a still darker hue, whilst those on the contrary, which were stained by the reduced silver, became somewhat paler, as if a portion of the argentine film were soluble in that menstruum; though it should be observed, that no further effect was produced on the stain even by a protracted digestion in ammonia. Now, upon making comparative experiments with a piece of the linen wrapper that had been recently "marked" in the usual way with a solution of nitrate of silver, the fibres were found to present a very similar appearance to that before described; the only difference being that the yellow coloration was not quite so distinct, and more of the silver-stain was removed by the solution of ammonia; whereas on the other hand, fibres that had been stained by solutions of chloride and oxide of silver in ammonia were uniformly colored of a dark brown or black, and exhibited no trace of yellow coloration.

These results conjoined with the corroded state of the linen in the vicinity of the marks, justify us, I think, in concluding that the ancient Egyptians were really acquainted with nitric acid; and, as my father has already suggested, employed the nitrate of silver as a marking-fluid. In what manner, however, they prepared the acid, whether by the distillation of the nitrate of soda or nitrate of potash with oil of vitriol, or by one of the processes adopted by the alchemists, I will not at present attempt to decide, but will leave the problem to be solved at some future period, when the researches of antiquarians shall have offered us further evidence on the subject.—*Annals of Pharmacy, from Philosophical Magazine.*

## METHOD FOR DETECTING SULPHURET OF CARBON.

BY A. VOGEL.

When to a solution of caustic potash in absolute alcohol as much sulphuret of carbon is added as will dissolve therein, a considerable quantity of whitish yellow crystals of xanthate of potash is formed.

At the suggestion of Baron Liebig, I have employed this property to detect small quantities of sulphuret of carbon in liquids. If only a few drops of sulphuret of carbon are added to a large quantity of an alcoholic solution of potash, or if a current of air is passed over sulphuret of carbon in this solution, the peculiar formation of crystals does not ensue, and the resulting compound can alone be detected by its behavior to salts of copper. The xanthate of potash gives, when decomposed with acetate or sulphate of copper, a voluminous citron yellow precipitate. This reaction also appears when only a small quantity of sulphuret of carbon is added to an alcoholic solution of potash, and is exhibited most distinctly if a little of the solution is allowed to evaporate on a watch-glass at ordinary temperature, and then the residue treated with salt of copper. As the yellow precipitate is almost insoluble in ammonia in the cold, we can separate it from the oxide of copper formed at the same time by this means.

Another property of the sulphuret of carbon can also be employed for a still more delicate reaction, when it is desirable to detect this substance. If an aqueous or alcoholic solution of sulphuret of carbon is boiled with potash, sulphuret of potassium is formed, which affords a black precipitate on the addition of nitrate of lead. When nitrate of lead is boiled with potash, and while boiling, an extremely diluted solution of sulphuret of carbon in water is added immediately, a black precipitate results. A drop of sulphuretted hydrogen, shaken with two quarts of water, exhibits distinctly this reaction, which is still applicable, therefore, in cases of extraordinary dilution.

It has been correctly assumed, that sulphuret of carbon is always contained in coal gas, because the conditions for its formation in the manufacture of gas from coal, which always contains sulphur, are in existence. No research is, however,

known to me which affords direct proof of this assumption. By the described reaction, very small traces of sulphuret of carbon may be detected in gas prepared from coals. Two cubic feet of purified coal gas, so completely freed from sulphuretted hydrogen by a watery solution of potash that it ceased to react on lead paper, were conducted slowly through an alcoholic solution of potash. A portion of this solution somewhat evaporated, and, added to a boiling solution of nitrate of lead, exhibited distinctly a black coloration, which could only arise from a small quantity of sulphuret of carbon contained in the gas.—*Annals of Pharmacy from Annalen der Chemie.*

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#### ON THE RECTIFICATION OF OIL OF NEROLI.

M. Donneey states that the color which oil of neroli rapidly acquires is due to a molecular change in one of the oils which constitute it, and which, it is well known, causes the oil to assume a brown color in a very short time, and a very disagreeable odor, which thus involves the loss of a costly product.

Some experiments having demonstrated the fixity of the oil which has undergone change, I distilled 250 grammes of neroli which had been thus affected, and which was five years old, and obtained 220 grammes of a perfectly colorless essential oil, having a fresh odor of neroli, and which remained unchanged during two years in a condition most favorable for the alteration of essential oils.—*Jour. de Pharm.*, Sept. 1853.

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#### ON THE SENSIBILITY OF THE REACTION OF SALICYLOUS AND SALICYLIC ACIDS ON THE SESQUIOXIDE OF IRON.

By M. ARMAND DOLLFUS, of Mulhausen.

It is well known that salicylous and salicylic acids cause a deep violet color when added to a solution of sesquioxide of iron, without producing a precipitate; and that the coloration by the latter acid is a little more beautiful and more intense than that by the salicylous acid; but to this time no accurate notice of the sensibility of reaction has been taken. Occupied in the study of the principal combinations of the salicylic series in the laboratory of Prof. Buchner, I have found that the reaction in question is more sensitive than that of sulphocyanide of potassium



with the sesquisalts of iron, which, to the present, was considered the most sensitive reagent for those salts except the sulphuret of ammonium.

M. Dollfus prepared a solution of sesquichloride of iron containing one part of the salt in 1000 parts of the liquid. This was reduced in strength by dilution with an equal volume at each reduction, testing the liquid each time until it ceased to be sensible to the test. In this way he found that a solution containing 1-64000th of the iron salt was fully colored by sulphocyanuret of potassium, and the 1-128000th not at all, whilst the salicylic acid produced a light violet tint in the solution containing but 1-572000th. M. Dollfus recommends this test as meriting the attention of chemists, and as being easily prepared from salicin.\*

Nevertheless, it is necessary to be aware that the ferric solution should be neutral as the reaction is hindered by free acids and even by the acetic acid, which is not the case with sulphocyanuret of potassium. Further, salicylic and salicylous acids do not act with neutral salts of the sesquioxide of iron with such organic acids as the citric and tartaric, and in this respect it is like potassa. It may be remarked that sulphocyanuret of potassium is also incapable of reaction with these salts.—*Jour. de Pharm.* Sept. 1853.

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#### CONTRIBUTIONS TO PHARMACY.

By JOHN P. METTAUER, M. D., LL. D. of Virginia,

Professor of the Principles and Practice of Medicine and Surgery, in the Medical Department of Randolph Macon College.

It will not be denied that the operation of therapeutical agents is essentially influenced by the mode by which they are prepared.

This fact, so generally true, is particularly exemplified in the preparations of cinchona, cantharides, colchicum, guaiacum, and several other medicinal substances of which I shall speak presently.

For more than twenty-five years, my attention has been particularly directed to this subject, and, during this period, I have

\* [Salicylic acid is most readily prepared by adding oil of *Gaultheria procumbens* to a hot solution of potassa as long as its odor is destroyed, and then adding pure muriatic acid, when the salicylic acid precipitates in crystals.—EDITOR AM. JOUR. PHARM.]



adopted several new methods of preparing some of the articles of the materia medica, and have satisfied myself, by repeated practical trials, that these preparations possessed superior efficacy to those generally employed.

Many years ago I prepared an acetous infusion of cantharides,\* for blistering purposes. This infusion was first designed for vesicating the scalps of infants, without removing the hair; and its action was very satisfactory. It was applied simply by wetting the surface of the head, and the hair nearest its roots, and then carefully covering the parts with a cabbage leaf, or oiled silk, to prevent the too sudden evaporation of the blistering fluid. When other parts of the body were to be blistered, a thin compress of bibulous paper, or cloth saturated with the infusion, was applied to them, and carefully covered with oiled silk. To insure speedy and effective vesication, I usually re-applied the tincture two or three times, after intervals of half an hour. I found this agent equally as efficient and certain in its action with adults as with infants. It rendered the removal of the hair unnecessary, as it blistered every part of the surface, even when a very thick head of hair existed. This preparation has been used by many of my medical friends, and with entire satisfaction. Within the last ten years, I was induced to prepare an ethereous solution of cantharides† as a vesicant, and have found it far more prompt and certain in its operation than the acetous infusion. It may be applied in the same manner as the latter. Frequently, merely wetting the skin with the solution, without covering the part, will blister; especially in infants. When adults are to be blistered, the preparation should generally be applied with a thin compress, and carefully covered, as already suggested,—moistening the compress from time to time, until the skin is decidedly reddened. I have found this by far the most convenient and reliable means of blistering that I have ever employed. This ethereal tincture of cantharides is also an efficient internal remedy. As an emmenagogue and diuretic it has greatly exceeded my expectation. The ethereous menstruum seems not only to promote the operation of the cantharidin

\* **R.** Canth. contus., ℥iiss.; Acid acet., Oij. Digest for 14 days, and filter.

† **R.** Cantharid. contus., ℥iij.; Spirit. æth. nitric, Oiiss. Digest for 8 days, and filter.

upon the genito-urinary organs; but at the same time to guard against strangury. I now use this preparation of cantharides almost exclusively, both externally, and internally, when the lytta is indicated, and have done so for seven or eight years.

The remarkable efficacy of the ethereous preparation of the Spanish Fly induced me, five years ago, to employ spirits of nitric ether as a menstruum for cubebæ, colchicum, guaiacum, squill, ergot, gossypium, sanguinaria, ipecacuanha, digitalis, nux vomica, and some other articles of less importance. The ethereous tincture of cubebæ\* is a most valuable remedy in all the sub-acute inflammations of the bladder, of the urethra, of the uterine cavity, and of the mucous lining of the stomach and intestines. It should be administered in some mucilaginous vehicle.

The tincture of colchicum† is applicable to the treatment of all of the cases demanding the use of the colchicum, and is decidedly preferable to the vinous seminal tincture now in use, by reason of its tendency to act on the urinary system. It is very well adapted to the treatment of sub-acute rheumatism, gout, œdema, and neuralgic rheumatism, especially if the urinary secretion is materially diminished in quantity. In the bloating occasionally connected with the dysmenorrhœa, a combination of this tincture with the ethereous tincture of cantharides, sanguinaria and gum guaiacum will be found a most valuable remedy. It should be taken three or four times daily in an infusion of pine tops, in doses of ten to twenty drops each. The same combination will also be found valuable in the sub-acute stage of gout and rheumatism.

The ethereous tincture of gum guaiacum‡ is superior to the preparations of that article now in general use in the treatment of rheumatism by reason of its tendency to act on the urinary system; and the same may be said of it as an emmenagogue when there is rheumatic irritation of the uterus as an associate cause of dysmenorrhœa.

\* R. Pip. cubeb. contus., ℥iv.; Spirit. æth. nitric, Oij Digest 8 days, and filter.

† R. Sem. colchic. contus., ℥iv.; Spirit. æth. nitric, Oij. Digest 10 days, and filter.

‡ R. Guiac. gum. resin, ℥iv.; Spirit. æth. nitric, Oij Digest 8 days, and decant.

The ethereous tincture of squill\* is adapted to all cases in which squill is indicated, and is an elegant preparation. In dropsy, œdema of the mucous lining of the larynx, and of the lungs, in asthma, and as an expectorant and diuretic it will be found a most convenient and valuable preparation. A combination of equal parts of this tincture and of the syrup of lobelia inflata taken three or four times daily, in doses of ʒss. to ʒj. each, is the most efficient remedy I have ever used in asthma.

The ethereous tincture of ergot† is best suited to cases of inaction or torpor of the uterus connected with debility or exhaustion; it may be used either as an emmenagogue or as a parturient. In uterine hæmorrhage, or menorrhagia dependent on debility, or exhaustion of the uterus, it will be found a valuable remedy. Its action upon the uterus is greatly influenced by the ethereous menstruum. It is best to give it in some diuretic vehicle, such as pine tops tea, or flax seed or elm tea; and it may be taken in doses of ʒss. to ʒij. once in four or five hours.

The tincture of gossypium‡ is possessed of properties very similar to that of ergot, and may be employed in like doses with it, and in similar diseases.

The tincture of sanguinaria§ is valuable when combined with the tinctures of cantharides, guaiacum, colchicum, cubebs, and indeed any other emmenagogue, in the treatment of dysmenorrhœa. It is also a valuable expectorant and diaphoretic in pneumonia, bronchitis, and œdema of the mucous lining of the air passages. It is administered in doses from ʒss. to ʒij., once in three or four hours. This tincture may also be employed alone as a diaphoretic and expectorant.

The ethereous tincture of ipecacuanha|| is so closely assimilated to the tincture of the sanguinaria in its therapeutical properties, as

\* R. Scill. maritim. contus., ʒiv.; Spirit. æth. nitric, Oij. Digest 8 days, and filter.

† R. Ergot. contus., ʒij.; spirit æth. nitric, Oj. Digest 10 days, and filter.

‡ R. Gossypii. herbac, ʒiv.; Spirit. æth. nitric, Oj. Digest for 10 days, and filter.

§ R. Sanguinar. canadens. contus. ʒij.; spirit. æth. nitric, Oij. Digest 8 days and filter.

|| R. Cephael. ipecac. rad. contus., ʒij.; spirit. æth. nitric., Oij. Digest 8 days, and filter.

to be applicable to the treatment of the same diseases. It is an elegant and most convenient preparation. In typhoid fever it will be found far superior to the ipecac pill as a diaphoretic, especially when the tongue is dry and the thirst urgent. It may be used also in typhus fever, or indeed in any febrile affections during the sub-acute stage. This valuable preparation acts both as a diaphoretic and diuretic in these cases, as well as an expectorant.

The ethereous tincture of *digitalis*\* is a far better preparation than the alcoholic, on account of its greater activity; and this it derives chiefly from the ethereous menstruum. In doses from  $\mathfrak{zss}$ . to  $\mathfrak{zj}$ ., in some diuretic infusion, taken three times daily, it will be found well adapted to all such cases as require the foxglove.

The ethereous tincture of *nux vomica*† is especially indicated in the treatment of seminal debility, or to speak more properly, debility of the generative organs. In this, the gravest of human ills, after such preliminary treatment as may be demanded for the correction of constipation, and prostatic tenderness, this tincture will be found a most excellent means of restoring the erections. It is also valuable in exciting appetite for food, and in the invigoration of the digestive organs. This preparation is well adapted likewise to the treatment of paraplegia, especially when the bladder and rectum are implicated, as well as such other form of paralysis as demand the *nux vomica* or its alkaloid. It may be given in doses from  $\mathfrak{zss}$ . to  $\mathfrak{ziss}$ . three times daily, before or after meals, in some bitter infusion. The cold infusion of wild cherry bark I have generally preferred as the vehicle for it.

The ethereous solutions or tinctures are more readily prepared, requiring to be digested for a less time than the alcoholic, and keep without the least deterioration. They are also adapted to these conditions of the constitution in which alcoholic menstrua would be objectionable.

*Hydrargyrum cum creta*. This valuable preparation of mercury is usually formed by triturating  $\mathfrak{z}ijj$ . mercury with  $\mathfrak{z}v$ . of prepared chalk, until the globules are extinguished. This is a tedious process and the resulting powder is not of uniform strength, nor is the

\* R. *Digital. purp. fal.*,  $\mathfrak{ziss}$ .; *spirit. æth. nitric.*, *Oij*. Digest for 10 days, and filter.

† R. *Nucis. vomicæ pulv.*,  $\mathfrak{z}ij$ .; *spirit. æth. nitric.*, *Oij*. Digest 10 days and filter.

mercury completely rubbed down. Indeed, it is questionable whether the powder, when apparently well formed, always contains mercury, as a compound may be readily formed by uniting other coloring substances with chalk, to imitate blue mercurial powder; and I think I have met with such imitations several times. The blue powder that I have procured from the shops has generally disappointed me; and for a number of years I have prepared it myself according to the following method:

Take one part of pure starch; eight parts of prepared chalk; and sixteen parts of mercury. Reduce the starch to fine powder. The chalk may now be added, and after being well mixed, the mercury can be united. The powder must next be moistened with water, but not to the extent of wetting it; and the whole rubbed until nearly dry, when the mass should be again moistened and rubbed dry. In this manner the process must be repeated from time to time, as may be convenient, until the powder assumes a uniform blueish appearance. After the chalk seems to be saturated with the mercury, rub the mass perfectly dry, and then moisten it sufficiently to make it adhere to the surface of the mortar by pressing with the pestle. By carefully passing the pestle over the adhering mass, so as to render its surface smooth the superfluous mercury will now escape from it in small globules and fall to the bottom of the mortar, and the separation may be facilitated by striking the bottom of the mortar against the table repeatedly, and by pouring the mercury over the surface of the mass where any globules appear. The mercury may now be removed from the mortar; and as soon as the mass becomes sufficiently dry, the trituration must be renewed and continued until the mass becomes a smooth, dry powder. Prepared according to this method, I have used blue powder in my practice more than twenty-five years, and have uniformly found it far more certain in its operation than that obtained from the shops. I prescribe it in the ordinary doses, or nearly so, and yet I am satisfied it is stronger than that in general use. I invariably direct it to be administered nearly dry, united with brown sugar, and to be mixed in a cup by stirring the powder and sugar together with a straw or the point of a knife. The dose may then be taken into the mouth and swallowed, first with the saliva, and afterwards with a mouthful of water. This powder should never be mixed in a silver spoon, or any other utensil possessing an affi-

nity for mercury, or the powder may be rendered entirely inert ; and such an accident once befell a patient of mine, who nearly lost her life before the cause of failure of the medicine in producing its proper effects was discovered.—*Virginia Medical and Surgical Journal*, Nov. 1853.

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## ON A NEW METHOD FOR DETERMINING THE COMMERCIAL VALUE OF MANGANESE.

By ASTLEY PASTON PRICE, Ph.D., F.C.S.,

Chemical Assistant in the Laboratory of the Government School of Mines.

It is well known that several methods have been described for determining the commercial value of oxide of manganese, that is to say for estimating the amount of chlorine capable of being obtained from a given sample of manganese.

There are, however, certain practical inconveniences attendant on the employment of many of these processes, most of them demanding an amount of time and manipulation which is most desirable to obviate.

The method I have for some time employed, and which I have found to give accurate results, is based on the conversion of arsenious into arsenic acid by means of chlorine, and the transformation of arsenious into arsenic acid by the employment of a solution of hypermanganate of potash.

The specimen of manganese under examination is dissolved in a normal hydrochloric acid solution of arsenious acid ; and the arsenious acid remaining unchanged into arsenic acid is determined by a standard solution of hypermanganate of potash. In employing a solvent containing a reducing agent, it will be found that the solution of the oxides of manganese is materially facilitated, and may be effected at a low temperature in a very short space of time.

In adopting this method, some difficulties presented themselves :—

1. On dissolving arsenious acid in hydrochloric acid, terchloride of arsenic is given off, and it becomes difficult to obtain a correct normal solution. This difficulty is avoided by dissolving the arsenious acid in a solution of caustic potash, and then adding the alkaline solution to an excess of hydrochloric acid.

Another difficulty occurred in effecting the solution of the oxide of manganese in the arsenical solution, as in proportion to the elevation of temperature does the loss of terchloride of arsenic increase. This source of error is prevented by employing a dilute acid solution of arsenious acid, and adapting one of Will's nitrogen bulbs, containing a solution of potash, to the flask in which the oxide of manganese is dissolved. Any terchloride of arsenic which may pass over is there effectually retained, provided solution be effected at a low temperature. The normal solution of arsenious acid is made by dissolving 113.53 grs. of arsenious acid, corresponding to 100 grs. of peroxide of manganese, in a solution of potash, and then adding hydrochloric acid until the solution occupies 100 measures.

A standard solution of hypermanganate of potash is obtained by diluting, for example, 5 measures of the normal solution of arsenious acid, corresponding to 5 grs. of peroxide of manganese, and then determining the number of measures of the solution of hypermanganate of potash that are required to transform the arsenious acid therein contained into arsenic acid.

These two solutions being obtained, an estimation of the value of a specimen of oxide of manganese may be expeditiously and accurately made.

Ten, or any number of grains of the specimen under examination, are placed in a small flask, to which 10 or more measures of the normal arsenical solution are added, and to the flask is adapted one of Will's nitrogen apparatus, containing a solution of potash. The flask is then placed in a water-bath, or a gentle heat is applied until solution is effected. The contents of the flask, after having been allowed to cool, are, together with the solution of potash, transferred to a larger flask, and diluted with water. The amount of arsenious acid remaining unchanged is then determined by the addition of the standard solution of hypermanganate of potash, and the quantity thus indicated being deducted from the number of grains of arsenious acid employed in the first instance, will give the value of the specimen submitted to analysis.

In order to obtain correct results by this method, it is of course necessary that the hydrochloric acid and the potash employed should be free from sulphurous or nitric acid, or any other reducing or oxidizing impurities.—*Chem. Gazette*, Nov. 1, 1853.



## Varieties.

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*Atmospheric pressure at the Eastern base of the Andes, as observed by Lieut. HERNDON, U. S. N.*—In 1851 the United States Government sent Lieut. Herndon to Peru, with directions to cross the Andes to the head navigable waters of the Amazon within the territory of that Government, and to follow them to the ocean through the main stream of that river, with the view of making observations on the climate, productions and commerce of the countries drained by its upper branches, and more especially in reference to the navigability of the latter streams. Having reached a suitable point he launched his canoe, and after a variety of adventures arrived safely at Para, having made a water voyage of 3200 miles. After sailing nearly 900 miles down the Ucayle in a Northern direction along the base of the mountains, by the indication of the boiling point of water he had descended from 1253 feet to 126 feet above the level of the ocean according to the usual method of reckoning, but here, to his surprise, the boiling point gradually descended again until he arrived at Egas, 900 miles further, when it indicated an elevation of 1715 feet, after which it gradually arose to the normal height at the Atlantic coast.

Lieut. Maury, U. S. Navy, in a communication to the Academy of Natural Sciences, Philadelphia, remarks in reference to Lieut. Herndon's observations, "that after ascending the Andes and coming down the Amazon to a considerable distance he (apparently) ascended or went up hill; now we know this was not the case, because he was all the time drifting down the stream in a canoe. To reconcile this apparent paradox between the inclination of this slope of the continent, as shown on the one hand by the running water of the river, and on the other by the pressure of the air, it is necessary to suppose that when he boiled his water at the Eastern base of the Andes, he was in fact *under a bank of atmosphere*, and that the pressure under this bank was so great as to force the boiling point up very nearly to the sea level."

"These experiments were made in South latitude, and in the trade wind region of that hemisphere. These winds strike nearly perpendicularly against the Andes, the tops of which range extend in many places nearly, if not quite, as high as do the trade winds themselves. Now, then, what is the effect of such an obstruction as the Andes afford to the passage of the South-east trade winds? If we may judge by similar obstructions to running water, we have no hesitation in saying that the effect is to bank up."

Lieut. Maury, by way of illustration, alludes to the effect produced at Hurlgate, where the water is piled up by resistance afforded by the natural obstructions to the passage of the tidal wave. In like manner he thinks



that Herndon's observations have revealed the existence of an air-cast mould of the Andes in the higher atmosphere. He further suggests that the barometric indications on the leeward or Western base of these mountains should be less than normal, and from some data in his possession he believes that at Lima such depression exists, yet further observations are necessary to establish this fact. We have been informed that a French traveller over the same route, on a previous occasion, observed the gradual depression of the boiling point as he sailed down stream, which so annoyed him that he destroyed his thermometer as valueless, and thus by not continuing his observations, deprived himself of the honor of first discovering this remarkable phenomenon.

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*Remarks on the Potato Disease.* Editor of the Chemical Gazette.—SIR: During the course of the last few months, that dreadful scourge, the potato blight, has again made its appearance amongst us, and has already committed great devastation in this and the sister island. My avocations having lately afforded me a few weeks leisure, I determined to devote it to the re-investigation of the subject, in the hope of ascertaining, if possible, the cause or origin of the disease, as well as a means of curing it or preventing its occurrence. I will not now occupy your time and space with a long account of all the experiments and researches that I have made with this object, but will content myself with making you acquainted with the general conclusions at which I have arrived. They are as follows:—

1. That the potato blight is neither directly nor indirectly caused by the ravages of any parasitical insect.

2. That it is the effect of a species of putrefactive fermentation or incipient decomposition of the nitrogenous, *i. e.* albuminoid constituents of the sap or cell-contents.

3. That this decomposition is either directly produced by a peculiar fungus, the *Botrytis infestans*—to which public attention has been already directed by other writers—or, what is in my opinion a still more probable supposition, the fungus referred to only makes its appearance after the fermentative processes have been in action for some time, and consequently is an effect, and not the cause of the disease.

4. That the blight has been in some measure produced by the long-continued and indiscriminate use of animal nitrogenous manure, which has over-stimulated the potato plant, and has thus rendered it more susceptible of disease, and has, in fact, produced the same effect upon it that alcoholic drinks, when taken in excess, do on the human system; that is to say, it has injured the stamina of the plant, and rendered the organism more readily affected by atmospheric and other influences.

5. That animal or highly-nitrogenous organic manures should be used with great caution in the cultivation of the potato, and indeed in that of all root crops; the best manure for the potato plant being the inorganic compounds, such, for instance, as those which are, or were at one time, used in parts of the Continent.

6. That the disease having once established itself, has become epidemic.
7. That it is contagious, if not infectious.
8. That the only mode of eradicating it is to restore the original constitution of the plant.
9. That this desirable result can be only brought about by introducing a complete alteration in the mode of cultivation that is adopted.
10. That the changes in question should consist,—1st, in thoroughly drying the seed potatoes, by the process now followed in some parts of Germany; 2dly, in steeping them for a short time in a dilute solution of the sulphate of copper (blue vitriol or blue stone,) of about the same strength as that used for “pickling” wheat; 3rdly, in planting them in *poor, well-drained* land; 4thly, and lastly, in substituting for the farm-yard manure, &c., now employed, some *inorganic* compost similar to those before alluded to.

In conclusion, I would suggest that the following simple experiment should be tried in storing the potato crop during the present season:—Let the tubers be stored in the usual way, but in the centre of each heap or sackful, let there be placed a quantity of *unslaked* lime, not in actual contact with the roots, but enclosed in some porous vessel—an old wicker basket, for instance—and covered over with, and surrounded by, a thick layer of straw or hay. By this means the tubers will be kept *dry*; and as the presence of humidity in the air is a great incentive to putrefactive decomposition, one of the main causes of decay will be removed. The lime, so soon as it has become slaked, may be taken away and employed as manure; and, if practicable, should be replaced with fresh lime. The experiment I have described, it must be remembered, can be easily tried, and would cost but little even if carried out on a large scale; it cannot be productive of any injurious consequences, and will be doubtless attended with beneficial results.

I remain, Sir, your obedient Servant,

Bristol, England.

THORNTON J. HERAPATH.

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*On the Employment of Pentasulphide of Calcium as a Means of preventing and destroying the Oidium Tuckeri, or Grape Disease.* By ASTLEY PASTON PRICE, Ph.D., F. C. S., Chemical Assistant in the Laboratory of the Government School of Mines.—Of those substances which have been employed to arrest the devastating effects of this disease, none appear to have been so pre-eminently successful as sulphur, whether employed as powdered or flowers of sulphur, or by sublimation in houses so affected. But notwithstanding the several methods described for its application to the vines, I am not aware that any has, or had, appeared prior to 1851, when these experiments were instituted, by which sulphur might be uniformly distributed over, and become to a certain extent firmly attached to the vines.

Three houses, situated at Margate in Kent, in the vicinity of the one in which the disease first made its appearance in England, having been for five consecutive years infected with the disease, and notwithstanding the

employment of sulphur as flowers of sulphur, no abatement in its ravages could be detected, I was induced to employ a solution of pentasulphide of calcium, a diluted solution of which having been found to act in no way injuriously to the young and delicate shoots of several plants, was applied to the vines; the object in view being that the pentasulphide should be decomposed by carbonic acid, and that 4 atoms of sulphur, together with the carbonate of lime formed, should be deposited in a uniform and durable covering on the stems and branches of the vines affected. Although but few applications were made, the stems became coated with a protective deposit of sulphur, and the disease gradually but effectively disappeared, insomuch that the houses have been, and now are, entirely free from any disease or symptoms of infection.

The young shoots are in no way affected by its application, and the older wood covered with the deposited sulphur continues exceedingly healthy.

The specimens exhibited to illustrate the durability and protective influence of the deposited sulphur were from vines which in the autumn of 1851 were covered with the disease, but which since the autumn of 1852 have received no further treatment.

The vines in the immediate neighbourhood, and adjoining one of the houses, are covered with the disease; but notwithstanding their close proximity, no indication of the disease has at present been detected in either of the three houses.

A solution of pentasulphide of calcium is prepared by boiling 30 parts by weight of caustic lime with 80 parts by weight of flowers of sulphur, suspended in a sufficient quantity of water; heat is applied until the solution has acquired a dark red color, and the excess of sulphur ceases to dissolve. The clear solution is drawn off, and after dilution with water may be applied to the vines by means of either a sponge, brush or syringe. A saturated solution of pentasulphide of calcium may be diluted with from 12 to 20 times its volume of water previous to being employed.—*Communicated by the Author.—Chem. Gaz. from Proc. British Association, 1853.*

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*Prizes Proposed.*—The Société d'Encouragement, of which M. Dumas is president, proposes to issue the following prizes:—

1. A prize of 3000 fr. to the author of the best work on the nature of the disease which attacks the vine.

2. A prize of 3000 fr. to the inventor of the most effectual method of preventing or destroying the disease of the vine.

3. Three prizes of 1000 fr. each, and six of 500 fr. each, in favor of authors of the best works on the following subjects.

(1.) Origin and progress of the disease: the work to be accompanied by charts illustrating the annual progress.

(2.) Discovery of a method of sowing at will the *Oidium* or of inoculating it.

(3.) Discovery of the conditions of hibernation peculiar to the *Oidium*.

(4.) An exact history, accompanied with authentic proofs of the effect obtained from the use of different manures, and especially the sulphurous.

(5.) Variations in the disease due to climates, exposures, soils, and meteorological circumstances.

(6.) Historical account, accompanied with authentic documents, of the effects, positive or negative, obtained from the different remedies proposed and hitherto employed.

(7.) Research on the effects produced on the vine towards removing the disease by plants or trees in their vicinity, and especially those which are rich in volatile oils, or which exhale a strong odor.

(8.) Invention of apparatus convenient of use, for throwing different water solutions or powders on the vine.

(9.) Indications of the measures which may be prescribed by authority for preserving the green-houses, and even whole vineyards from the ravages of the disease.

The society at the same time issues a list of the different works which have been published on this subject, and will distribute all these documents gratuitously.—*Silliman's Journal*, Nov. 1853.

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*On the Origin and Composition of a Mineral called Rotten-Stone.* By PROF. JOHNSTON.—After having stated the district, the Great Fin, Derbyshire, in which the mineral was found, the Professor went on to describe its chemical character and affinity. He observed that its component parts were not of a constant character, as had been asserted in some mineralogical works. Its origin was stated by Phillips to be from the decomposition of the slate rocks of Derbyshire. When examined under the microscope, it did not exhibit any organisms; but there were particles or bundles of some substance resembling the bituminous substances found near Castleford. Rotten-stone was found in lumps of all shapes and sizes, at depths varying from 2 to 6 feet below the surface of the earth. It was his (the Professor's) opinion that the rotten-stone was not the result of the decomposition of the shale of Derbyshire, but of the veins of black marble of the country, which had undergone a great change. In proof of this assertion, he produced specimens which he found to be black marble, with the merest coating of rotten-stone on them, whilst others were half rotten-stone and half black marble. The decomposition had been effected by dissolving the lime out of the rock, and not the rotting of the strata. This substance can be produced by dissolving the lime out of limestone, by bringing weak acids to bear upon it. This proved that there must necessarily exist in the soil some acid which dissolves the lime with which it comes in contact. Farmers would, therefore, see the necessity of adding lime to their land from time to time, because the lime kept continually washing away by the waters of heaven falling on it, and extracting from the rotting roots of the earth an acid which had a powerful effect not only on lime but on other mineralogical structures as well.—*Chem. Gaz.* Nov. 1853, from *Athenæum*.

*On Crystals from the Sea-Coast of Africa.* By J. PEARSALL.—The crystals here shown were obtained by Captain Mitchell, of the merchant ship "Frankfield," while searching the coast of Africa, between Saldanha Bay and the island of Ichaboe, for guano deposits. The crystals are of carbonate of lime, enclosing sand; 15 to 20 per cent. of sand is obtained from some specimens. The crystals are very hard, and have sharp cutting edges, so as to make it a painful task to walk upon them. The beach was covered with crystals to the extent of miles; about three miles was walked over, but it seemed as far as the eye could reach, and was one-half to one mile in breadth. Some of the specimens are from 4 to 5 inches in length, and with surfaces showing a thickness of  $\frac{1}{2}$  an inch, and from 2 to 3 inches across the plane. The report given was that some of the crystals protruded up from the sands so far as to wound the ankles and legs without great care in walking over. Some crystals seem to be opaque, with the sand enclosed except at the edges; 15 to 20 per cent. of sand is obtained from portions of crystals. Carbonate of lime and magnesia, with small quantities of saline matter, common salt principally, can be obtained by breaking them up in distilled water. They are entirely soluble in diluted nitric acid. Mineralogists and chemists are perfectly well aware of the stony substance called Fontainebleau sandstone, where the sandstone is found having forms of crystals of carbonate of lime. The crystals now exhibited show the grains of sand of the beach enclosed, without altering the general form, and also that the crystal has at its base adapted itself to the sand and other crystals.—*Chem. Gaz*, Nov. 1853, from *Athenæum*.

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*Telegraphic Progress.*—The Magnetic Telegraph Company effected their communication between England and Ireland on Monday week, when their new cable between Donaghadee and Portpatrick was successfully laid down.

The prospectus has been issued of an association, under the title of the Mediterranean Electric Telegraph Company, formed with the object of uniting Europe with Africa, the East Indies, and Australia, by way of France, Piedmont, Corsica, Sardinia, Algeria, and Egypt. The route is said to have been carefully surveyed. The company are making arrangements for the construction of a subterranean line along the coast of Africa, from Algeria to Alexandria; and with the aid of the British Government and the East India Company, the wires may be prolonged across the Desert, the Red Sea, Arabia, and Persia, to meet the great Indian line of 3000 miles, now in course of construction by the East India Company, and which may eventually be extended to the Australian colonies. The capital is 300,000*l.* in 30,000 shares, of 10*l.* each, deposit 4*l.* per share. The Government of France is said to have guaranteed interest on 180,000*l.* and that of Sardinia on 120,000*l.* A contract has been entered into for the complete execution of the works from Spezzia to Tunis, including all preliminary expenses, and a transfer of the concessions, with exclusive privilege for fifty years, for the sum of 300,000*l.*, the amount on which interest has been guaranteed. The works are said to be

already in active progress in Sardinia.—*Franklin Institute Journal and London Builder*.

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*The Presence of Pyrogallie Acid in Pyroligneous Acid.* BY DR. PETTENKOFER.—I have ascertained that wood-vinegar contains a not inconsiderable quantity of pyrogallie acid, and have made the discovery through the very fine blue color which salts of iron exhibit in crude wood vinegar under certain conditions, and which depends upon the presence of pyrogallie acid, as shown by researches instituted by my assistant, M. Pauli, which remains behind by the evaporation of the vinegar at a gentle heat, and was obtained by him in a completely pure condition by sublimation.

This acid is doubtless produced from tannin by decomposition during the dry distillation of the wood, and its presence in wood-vinegar affords an indirect proof that the pine-wood, which is generally employed for making charcoal and gas, contains a peculiar tannic acid.

Pettenkofer's discovery further explains why the ordinary malt vinegar is not employed by calico printers and dyers for the preparation of certain mordants, and particularly for acetate of iron, as the presence of pyrogallie acid in such mordants appears to be necessary for the production of certain shades of color.—*Annals of Pharmacy*, Oct. 1853, from *Buchner's Repertorium*.

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*Preparation of Hydro-Ferrocyanic Acid.* BY JUSTUS LIEBIG.—When a cold solution of ferrocyanuret of potassium is mixed in small portions, with its volume of smoking muriatic acid, a snow white precipitate of pure hydro-ferrocyanic acid, free from potash, results, if the muriatic acid is quite free from iron. This can be washed with muriatic acid almost without loss. Dried on a tile it dissolves readily and completely in alcohol, and can be obtained therefrom by the introduction of a layer of ether, and standing, in beautiful crystals free from muriatic acid.—*Annals of Pharmacy*, Oct. 1853.

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*Reproduction of Cotton from Pyroxyline.*—The following observation on the restoration of cotton from pyroxyline, was made by M. Bechamp, Professor at the School of Pharmacy at Strasburg. The process consists in heating pyroxyline, at the temperature of boiling water, with a concentrated solution of protochloride of iron. The chlorid deepens in color, and very soon there is a disengagement of pure nitric oxide. When this disengagement has ceased, the process is ended, after washing the cotton with chlorohydric acid to remove the peroxide of iron impregnating the cotton fibres.

By a similar method, M. Bechamp has succeeded in reproducing amidon from xyloidine, gum from nitric gum; and he has thus found a process which may be applied without doubt to many substances containing nitrogen in the state of NO<sub>2</sub>.—*Silliman's Journal*, Nov. 1853.

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*Administration of Ether in Capsules.*—In the *Journal de Medecine et de Chirurgie Pratiques* for April, 1853, M. CLERTAN, of Dijon, states that he

has for some time been accustomed to give ether in capsules in nervous affections. After several years of observation, by himself and others, he concludes that ether, when introduced in a known dose, pure, and without loss, into the stomach, has an effect which was totally unknown until the preparation of the ether pearls (*perles d'ether*). According to the old plan, the ether became partly volatilized before passing half-way down the œsophagus; and what arrived in the stomach was dissolved in water, and in a state favorable to rapid and sudden volatilization. M. Clertan has several times seen neuralgia, hemicrania, and gastralgia arrested instantaneously by from one to three of these capsules; while ether draughts, and ether in syrup, had been largely given without any effect.

The editor of the *Union Medicale* for April 12, in noticing M. Clertan's preparation, states the ether capsules are already employed extensively by M. Trousseau, M. Pidoux, and other practitioners in Paris. The advantages of the capsules are:—

1. The ether can be administered in a known dose—each capsule containing four or five drops.
2. The capsules are inodorous; so that ether can, without their knowledge, be given to persons to whom its smell is repulsive.
3. The capsules permit neither evaporation nor decomposition of the ether; they may be kept a year at least, or indefinitely, according to M. Clertan.
4. The ether arrives in the stomach without irritating the membrane of the mouth or pharynx, or producing cough; and it produces its sedative action by its rapid absorption.—*American Journal, from Assoc. Med. Journ. Sept. 2, 1853.*

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*Ferruginous Collodion.*—Having observed the utility of the salts of iron in erysipelas, M. ARAM, to facilitate their application, combined them with collodion, forming a preparation which united the compressive and astringent effects. It consists of equal parts of collodion and Bestuchef's tincture (etheral tincture of perchloride of iron). Spread on the skin, it forms a somewhat thinner pellicle than ordinary collodion, but it is much more supple and resisting, so that the limb can be moved in any direction without the cracking which takes place when collodion alone is used. Its adhesion is also more prolonged.—*Brit. and For. Med.-Chir. Rev.* July, 1853, from *Bull. de Therapeutique*, t. xlv. from *American Journal*.

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*Valerianate of Atropia.*—Mons. Michea has communicated an article to the Academy of Medicine, in Paris, on the therapeutical employment of this substance, which contains the active principles both of valerian and of belladonna. Without going into detail on the medicinal action of the valerianate of atropia, or atropine, the particulars of which we leave for our contemporaries, the medical journals, it may be stated that M. Michea recommends it strongly as a remedy in many of the spasmodic or convulsive diseases, in which he affirms it has been given with great success, beginning with an extremely small dose—a milligramme daily for an adult. It is preferable to



either valerian or belladonna for these reasons: first, because it is not liable to the inconveniences that attend the use of the plants, the alcoholic extracts and powders of which are almost always so uncertain in their action even when recently prepared, to say nothing of the disagreeable odor of valerian, which renders it inadmissible to some patients; and secondly on this account, that, like all other active principles, it acts when administered in very minute doses, and most frequently with a certainty that may be depended upon. *Annals of Pharmacy*, Nov. 1853.

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*Production of Iodine in France.*—According to Payen, the manufacture of iodine in France affords 300,000 kilogrammes of sulphate of potash, 340,000 kilogrammes of chloride of sodium, 3,450 kilogrammes of iodine, or an equivalent quantity of iodide of potassium, and 250 kilogrammes of bromine or bromide of potassium, and 2,000,000 kilogrammes of dry lixivated residue. The consumption of iodine in the last year has risen so high that the quantity produced in France is not sufficient for French consumption, and on that account foreign iodine must be introduced.—*Annals of Pharm.*, July, 1853.

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*New Cement*—By L. BELFORD.—This improved cement is formed by the admixture of the following ingredients; viz.—64 parts by weight of gutta percha, 16 parts of caoutchouc, 8 parts of pitch; 4 parts of shellac, and 8 parts of oil. The ingredients are melted together, the caoutchouc having previously been dissolved. This cement is used for uniting the parts of boots and shoes, and in the manufacture of articles of dress in which cement is required.—*Ibid.*

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*Improvements in Deodorizing Cod-Liver Oil.* By Sir JAMES MURRAY, KNT., M.D.—This invention, for which a patent has been obtained, consists in subjecting cod-liver oil, placed in high pressure cylinders made of silver or other suitable material, to the influence of carbonic acid gas in combination with continuous agitation. For this purpose an apparatus of a similar kind to that employed in the manufacture of soda-water is made use of, which should be sufficiently strong to withstand a pressure of 200 lbs. on the square inch. By means of agitators or beaters attached to the revolving axle of the cylinder, the carbonic acid, injected by a force-pump, is brought into contact with every particle of the oil, which thus becomes deodorized, the unpleasant odor or flavor being discharged by suitable contrivances into the atmosphere. Instead of oil alone, any admixture of it with alkaline, mucilaginous, or other solutions, may be treated in a similar manner to that above mentioned.—*London Pharm. Journal*, Oct., 1853.

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*The Solubility of Biniodide of Mercury in Cod-Liver Oil.*—I find by experiment that cod-liver oil possesses the property of dissolving biniodide of mercury, and as both are often administered at the same time, the medical practitioner will find it convenient when these remedies are required to be given



together, to dissolve the biniodide in the oil. Solution is readily effected at the ordinary temperature of the atmosphere to the extent of *half a grain* to the *fluid ounce*, by rubbing down the biniodide in a small portion of the oil, mixing it with the remainder in a bottle, and shaking for a few moments; at the temperature of 50° C. two grains are permanently dissolved by one fluid ounce of oil.

I also find that biniodide of mercury dissolves with the same facility in almond, olive, and castor oils, also in chloroform, pyroxilic spirit, and melted lard and spermaceti cerate.

J. B. BARNES.

1, *Trevor Terrace, Knightbridge.*

*Ibid.*

*Unguentum Pyroligni Juniperi.*—Mr. Erasmus Wilson has furnished us with the formula for this preparation, which he has used with success in some cutaneous disorders:

R. Ceræ Flavæ . . . . .	4 ozs.	
Adipis ppt. . . . .	6 "	
Sevi ppt. . . . .	6 "	
Olei Juniperi pyrolig. . . . .	16 "	Misce.

The pyroligneous oil of juniper, or juniper tar, is obtained by the destructive distillation of juniper wood. It is called in France Huile de Cade. We believe it is not prepared in this country, but may be obtained from Dr. M. Meidenbach, Aix-la Chapelle.—*Ibid.*

*Syrup of Castor.*—At the sitting of the *Academie de Médecine*, October 4th, 1853, M. Lebron, Pharmacien, communicated a notice relative to a formula for syrup of castor. It consists of

Distilled water of Valerian . . . . .	10 parts.
" " Cherry laurel . . . . .	5 "
White Sugar . . . . .	30 "
Castor . . . . .	9.5 "

*L'abeille Medicale, Oct. 15.*

*A New Mode of Mending an old Sieve.* TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.—Sir: I have been employing myself this evening, since the shop has been closed (we all in this town close at eight o'clock), in doctoring an old sieve, and as the result is satisfactory to myself I communicate the same to you. The sieve is a wire sieve, and had been laid by for a considerable time as useless on account of the many holes and fractures in the texture of the wire, besides which the meshes were very much clogged. I first had the sieve well washed with soda and water, then when thoroughly dry passed the sieve slowly over a gas flame, which soon carbonized what remained in the meshes and allowed it to be removed with a dusting-brush. I then filled the torn and broken parts of the sieve with gutta percha, by cutting a bit from a sheet of the article about the size of a stick of lunar caustic, just melting the end in the gas flame and rubbing it over the broken part of the sieve as soon as it is applied, applying a little friction over it with my

moistened finger. I have thus obtained a useful sieve from one which would otherwise have been thrown away.

Thinking that the hint may be useful to others, I am your obedient Servant,

THOMAS BARLING, M. P. S.

Weymouth, Sept. 22, 185.

London Pharm. Journal, Oct., 1853.

*Composition of Squill.*—M. Tilloy (Jour. de Pharm., June 1853,) states that the bulb of *Scilla maritima* contains,

1st. A poisonous, very acrid resinoid substance, soluble in alcohol and not in ether.

2d. A yellow, very bitter principle soluble in water and alcohol.

3d. A fatty matter, without taste, soluble in ether and not alcohol when it is freed entirely from the bitter and acrid principles.

4th. Citrate of lime, the pungent action of which is purely mechanical.

5th. And lastly, a mucus like substance and sugar.—*Ibid.*

*Quackery in England.*—Of all countries in the world, England is that in which quacks and quackery flourish most. According to the census returns, there are nearly 30,000 persons practising one or more departments of medicine and surgery without qualifications.—*Manchester paper, and Boston Journal.*

*Valuable Medical Donation.*—A physician, attached to one of the hospitals in Paris, has recently donated to the proprietors of the *Gazette des Hopitaux*, one of the oldest Medical Journals in France, 10,000 francs per annum, on the following considerations :

1st, That the donor's name shall forever be kept an inviolable secret.

2d, That 3,000f. per annum of the sum shall be employed in encouraging the authors of useful and practical papers published in the *Gazette*.

3d, That the remaining 7,000f. be employed in distributing copies of the *Gazette* to physicians or students who are too poor to pay the whole or any part of the subscription, the simple declaration to that effect of the applicants being all that is to be required.—*Boston Medical and Surgical Journal.*

*New Application of Photography—Daguerreotypes on Wood.*—Mr. R. Langton, wood engraver and draftsman, of Manchester, has produced some very successful and beautiful specimens of photography, taken by himself, on blocks of box-wood. This photography, so taken, is quite ready for the application of the wood engraver's burin. It is impossible to say how greatly this will advance the process of wood engraving, especially by saving all the preliminary labor of the draftsmen ; which, in many cases, constitutes the chief element in both the time and the cost attendant on the production of wood-engravings of a high class. Even in many of the lower branches of the art, the new application of sun-drawing will be an invaluable auxiliary. For instance, it is an exceedingly difficult matter to get accurate drawings of machinery, in perspective ; mechanical draftsmen only represent it in plane

and artists are generally found extremely reluctant to employ a large amount of time so unprofitably as the drawing of a complicated machine in perspective demands. These photographs can now in a few seconds accomplish what it require hours for the artist to effect; and in point of accuracy the instrument must ever have the preference. But great as will eventually be the boon which this new application of photography will confer on the practical art of wood engraving, it may be made more extensively valuable, as a cheap form of producing pictorial objects. By Mr. Langton's process portraits, landscapes, &c., could be produced on any smooth piece of wood, duly prepared; and thus even wooden snuffboxes, hand screens, &c., may be decorated with portraits or scenes from nature, or copies of works, of art, at a cost much less than daguerreotypes on metal plates. Indeed, it is difficult to say where the applications and uses of this new process may not extend. The inventor does not limit his invention to its use in wood engraving, but claims for it an equally useful and valuable application in other directions, in connexion with practical art.—*London Civil Engineer and Architect's Journal, and Franklin Inst. Journal, for Dec. 1853.*

*New Preparation of Iodine.* By M. RENAULT.—At the meeting of the Academy of Medicine of Paris, of July 19th, M. Lecanu read a report upon the researches of M. Renault, a pharmacien of Paris, which had resulted in the discovery of a new combination of iodine, which was offered as an occasional substitute for cod-liver oil.

Direct experiments being wanting, chemists have concluded by analogy, that iodine precipitated albumen, as chlorine is known to do. This, however, is not the fact. On the contrary, albumen will dissolve considerable quantities of iodine. While water will only take up a trace of this metalloid, a quart of water impregnated with six ounces of the white of egg will dissolve two and a half drachms of iodine entirely. M. Lecanu thought that the *albumine iodée* of M. Renault might be of great therapeutical utility. M. Gibert vehemently opposed the conclusions of the report, on the ground that they were unsupported by clinical experiment.—*Virginia Med. and Surg. Journal, from Bulletin de l'Académie Impériale de Médecine. July 31st.*

*Varnish for Applying Leather.*

Alcohol,	.	.	.	20	gallons.
Shellac (2d orange),	.	.	.	35	lbs.
Rosin (clean)	.	.	.	20	"
White Turpentine,	.	.	.	10	"
Lampblack (pulverised),	.	.	.	4	"

Bruise the shellac and rosin, and early next morning put them in the alcohol and stir ten or twelve times during the day, which will prevent the formation of lumps and will nearly dissolve it in one day. Next day add the turpentine and stir five or six times; third day stir in lampblack, powdered and sifted.

The above is truly excellent, and before adopting the *process* it gave us trouble; it is prepared in a whiskey barrel. No heat is employed.—E. S. FREY.

*Recipes for Cologne Water, from Redwood Gray's Supplement.*

R Oil of Neroli	ʒij	R Oil of Bergamot	ʒiij
Oil of Orange Peel	ʒiiss	Oil of Lemons	ʒij
Oil of Citron	ʒj	Oil of Lavender	ʒiiiss
Oil of Bergamot	ʒij	Oil of Neroli	ʒiiss
Oil of Lavender		Oil of Origanum	ʒij
Oil of Rosemary aa	ʒss	Oil of Rosemary	ʒj
Oil of Cinnamon	ʒj	Essence of Vanilla	ʒij
Cardamoms, powdered		Musk	gr. x
Balsam Peru aa	ʒij	Rectified Spirit	Oxiii
Rectified Spirit	lb. vii	Rose Water	Oij
Macerate ten days, then distill six pounds with a gentle heat.— <i>Pharm. Badensia</i> , 1841.		Orange Flower Water	Oj
		Mix the oils; dissolve them in ten pints of the spirit; then add the musk, and finally the waters, previously mixed with the remainder of the spirit, and after standing two weeks' filter.	

*Preparation of a Drying Oil for Zinc Paint.*—In order to avoid the use of oxide of lead in making drying oil for zinc paint, oxide of manganese has been proposed as a substitute. The process to be adopted is as follows:—

The manganese is broken into pieces about the size of peas, dried, and the powder separated by means of a sieve. The fragments are then to be introduced into a bag made of iron wire gauze. This is hung in the oil contained in an iron or copper vessel, and the whole heated gently for twenty-four or thirty-six hours. The oil must not be allowed to boil, in which case there is great danger of its running over. When the oil has acquired a reddish color, it is to be poured into an appropriate vessel to clear.

For 100 parts of oil ten of oxide of manganese may be employed, which will serve for several operations when freshly broken and the dust separated. Experience has shown, that when fresh oxide of manganese is used, it is better to introduce it into the oil upon the second day. The process likewise occupies a longer time with the fresh oxide. Very great care is requisite in this operation to prevent accident, and one of the principal points to be observed is, that the oil is not overheated. If the boiling should render the oil too thick, this may be remedied by an addition of turpentine after it has thoroughly cooled.—*Pharm. Journal*, Dec. 1, 1853, from *Allg. Polytech., Zeitung*:

*Means of Detecting and Separating Copper from Brandy.*—BÖTTIGER states, that when a few drops of olive oil are added to brandy containing copper, the whole well shaken and allowed to stand until the oil has per

fectly separated, it has a greenish color, and contains the whole of the copper salt which was present in the brandy.—*Ibid*, from *Polytechn. Notizblatt*, 1853.

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*Poisoning by Aconitum Napellus*.—In the *Times* of November 10th is the report of a case of poisoning by aconite root, taken by mistake for horseradish, from which it appears that Mr. Joseph Russell, of Chard, Somersetshire, being on a visit to his brother in Bristol, partook of some roast beef for dinner, and having expressed a wish for some horseradish, some was procured from the garden and dressed in the usual manner. It was remarked at the time that it must have been very bad horseradish, as it did not possess the usual flavor. Soon after dinner Joseph Russell complained of a peculiar tingling sensation in his hands and arms, which rapidly increased. Brandy was given, and medical aid instantly procured, but he rapidly sunk, and died in about an hour. His brother experienced the same sensations in a slighter degree, and is now recovered. On examination it was found that the root was that of *Aconitum napellus*. An inquest was held on the body of the deceased, and a verdict was returned of "Died of strong narcotic poison, *Aconitum napellus*, taken in mistake for horseradish."

A similar case is mentioned by Dr. Pereira (*Materia Medica*, vol. ii., page 2170, Third Edition); and in a foot-note by the editors another case is mentioned (reported in the *Times* of Nov. 4, 1842), in which the same root was taken by mistake for horseradish.—*Pharm. Journal*, Dec. 1, 1853.

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*New Compositions for Lubricating Railway Carriage Axles, Machinery, &c.* By MR. HILL (of the great Western Railway).—No. 1.—Boil 1 cwt. of rice in a sufficient quantity of water to increase its weight about sixfold and, when boiled, add about 4 cwt. of liquid alkali prepared as follows:—Take 1 cwt. of British alkali, 1 cwt. of lime, and 8 cwt. of boiling water, and stir the same well together; then, after standing for twenty-four hours, the liquid will be ready to be combined with the pulp or paste. This liquid should not exceed five per cent. of soda in strength, tested according to the usual mode.

The 4 cwt. of alkaline liquid, above mentioned, having been mixed with the pulp, the whole is boiled and stirred well together for a short time, and the mixture run off and rubbed through a very fine sieve. About 2 cwt. of tallow, 3 cwt. of palm oil, 4 cwt. of caustic alkali, and 4 cwt. of water are next melted, and boiled together; the pulp is then added, stirring it in with the grease and alkali, until all are thoroughly mixed; the compound is then to be rubbed through a sieve, and passed into coolers to consolidate, after which it will be ready for use.

No. 2.—A cheaper lubricating material may be made as follows:—1 cwt. of bean or other flour is made into a paste, by adding it to, and stirring it

well with, about 6 cwt. of boiling water; 8 cwt. of milk of lime, about the consistence of cream, are then added. When the flour and lime are well mixed together, 10 cwt. of fresh rosin oil are added, and the whole well stirred until the mass becomes thoroughly mixed, and of a thick consistence.

No. 3.—A fluid lubricating compound, to be used as a substitute for oil, may be made by mixing together 3 cwt. of liquid linseed or diluted rice pulp, 1 cwt. of linseed oil, 1 cwt. of rape oil, and 14 lbs. of soda solution. The liquid linseed is prepared by boiling 1 cwt. of linseed with *q. s.* of water to yield a product weighing about 12 cwt. of a thickish consistence. The soda solution is prepared by dissolving 28 lbs. of soda in 2 cwt. of water.—*Annals of Pharmacy.*

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*Preparation of Uric Acid from the Excrements of Pigeons.* By A. E. ARPPE.—In a capacious copper boiler, 10 ounces of borax were dissolved in 70 pounds of water. Into this solution two linen bags, each containing  $3\frac{1}{2}$  pounds of the dried excrements of pigeons, were introduced, and boiled one hour, and stirred; after which, the bags were removed and allowed to drain. In the boiling borax solution  $\frac{1}{2}$  pound of sal-ammoniac was dissolved, the vessel then removed from the fire, and allowed to cool. After 12 hours, a considerable greyish white precipitate of urate of ammonia was deposited at the bottom of the vessel. The above clear, strongly brown colored fluid was removed with a syphon, fresh water poured on, and this operation repeated until the liquid had become quite colorless. The precipitate was then again boiled with a weak solution of borax, by which a large quantity of a slimy mass remained undissolved. The solution, which can now be filtered through paper, and is colored slightly brown, is warmed and poured into a warm mixture, consisting of  $\frac{1}{2}$  ounce of sulphuric acid, with 1 ounce of water. After cooling, the uric acid separates in the crystalline form. It is colored light brown, and is purified by solution in potash, evaporation of the liquid, and a repetition of this operation, and, lastly, by decomposition with sulphuric acid. I have in this way obtained  $\frac{1}{3}$  per cent. of quite snow white uric acid from the excrements of pigeons, and believe the modifications here described in the mode of the preparation of this important acid to be practically valuable, as opportunity is very seldom afforded to procure it from the more abundant excrements of serpents.—*Ibid. from Liebig's Annalen.*

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*New Gutta Percha Cements.*—For uniting sheet gutta percha to silk or other fabrics: Gutta percha, 40 lbs.; caoutchouc, 3 lbs.; shellac, 3 lbs.; Canada balsam, or Venice turpentine, 14 lbs.; liquid styrax, 35 lbs.; gum mastic, 4 lbs.; oxide of lead, 1 lb.

For uniting sheet gutta percha to leather, as soles of shoes, &c.: Gutta percha 50 lbs.; Venice turpentine, 40 lbs.; shellac, 4 lbs.; caoutchouc, 1 lb.; liquid styrax 5 lbs.—*Annals of Pharmacy, Dec. 1853.*

## Editorial Department.

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AMERICAN PHARMACEUTICAL ASSOCIATION.—The Committee who were appointed, in reference to pharmaceutical education, at the last meeting of the Association (W. Procter, Jr., and Edward Parrish, of Philadelphia, John Meakim, of New York, and David Stewart, M. D., of Baltimore), in pursuance of the duty assigned them, would solicit from their brethren in all parts of the Union, answers as full as possible to the following queries, viz:

1. What is the usual manner of engaging apprentices to the drug and apothecary business as to length of service, recompense, &c., in your district, city, or neighborhood?

2. Is it usual to give attention to the preliminary education and training of applicants in taking apprentices?

3. Is any personal instruction extended to apprentices beyond the practical details of the shop, as regards chemistry, materia-medica, and botany?

4. What books are usually provided for apprentices from which they may derive scientific information bearing on their business?

5. Having been informed that the tenure of apprenticeship is very slight, in the Southern and Western States, and that pharmacutists have to depend chiefly on salaried assistants, the Committee wish to learn to what extent they have been correctly informed.

6. Do you know of any instances of the apprentices or assistants of pharmacutists attending lectures at medical schools, and how many?

The answers may be directed to the chairman, W. Procter, Jr., 166 South Ninth street, Philadelphia, or to either member of the Committee.

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LOCAL FORMULÆ.—The Executive Committee of the American Pharmaceutical Association (W. Procter, jr., T. B. Merrick, and J. Laidley,) wish to call the attention of their brethren to the following resolution of the Association:

“Resolved, that the letter of Mr. Meakim, in reference to securing uniformity in the preparation of unofficinal compounds be referred to the Executive Committee, with instructions to request the forwarding to them of such local formulæ as pharmacutists may wish to communicate.”

In explanation of this resolution the Committee will state that it has reference more particularly to recipes of unofficinal preparations prescribed by physicians, and for which there are no generally recognized formulæ—as



for instance Dewee's Carminative, Syrup of Morphia, Tincture of Arnica, and that it is the intention of the Association (should their request be attended to), to publish them in a compiled form for the benefit of all.

Any Pharmacutists who may feel disposed to respond to this call are requested to direct their communications to either member of the committee they may prefer to address.

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**MEDICAL LEGISLATION IN LOUISIANA.**—"Laws of the State of Louisiana in relation to the practice of physic, surgery, midwifery, and the profession of apothecary, and rules and regulations of the Medical Board of the Eastern District, in reference thereto, New Orleans, Nov. 1847."

The above is the title of a pamphlet we have met with recently. The Legislature of Louisiana passed a law, March 16, 1816, declaring, in Section 1st, that "no individual shall have the right to practice physic, or the profession of apothecary, in any part of the State of Louisiana, without having previously undergone an examination in the city of New Orleans." Section 2d makes it the duty of the Governor to appoint annually a medical board, composed of four physicians and one apothecary, for the purpose of examining applicants. Section 3d requires the applicant to petition the Mayor of New Orleans, who thereupon summons the Board of Examiners, who shall conduct the examination in the presence of the Mayor, and two Aldermen designated by him, when, if the answers are satisfactory to a majority of the Board, a certificate is given, signed by all those present, and certified by the Mayor, which is required to be recorded. Section 4th fixes the penalty of contravening this law at a fine of \$100, and imprisonment not beyond one year.

This Act was modified in 1817, 1820, and lastly in 1840. There are now two districts, each having an Examining Board, New Orleans being the principal, or Eastern centre. The applicant is now required to deposit a legally acquired medical or pharmaceutical certificate with the Secretary of the Board before being examined, and on receiving a license to practise, to pay \$20 therefor. If rejected at first, he may claim another, but public examination by the same examiners, after duly publishing the time of the examination in the Gazettes in English and French.

We do not know whether this law is strictly carried out; but if so, it is certainly calculated to influence favorably the condition of practical medicine and pharmacy. Cannot some of our New Orleans readers furnish us with a sketch of the state of pharmacy in that city?

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**PROFESSIONAL QUACKERY.**—We find the following under the editorial head, in the *Charleston Medical Journal and Review* for November, page 857, viz;

"*Dr. Norwood's Tincture of Veratrum Viride.*—On another page will be found the advertisement of Dr. Norwood, in relation to price; &c.. of the tincture of Veratrum Viride, prepared by himself.

"We would strongly advise those of our readers who may wish to use



this substance, to obtain it immediately from Dr. Norwood himself, or from his authorized agents. We are certain that it is the only source whence the *genuine and efficient tincture* can be had; an extensive trial of that prepared at the North, thus far, having satisfied us that it cannot be relied upon, in consequence of its not being made from the root of the carefully dried plant, as that used by Dr. Norwood.

"It would be a work of supererogation to enumerate the different diseases in which this drug is reported to be beneficial, the pages of the Southern medical journals (including our own) having teemed, in the last two years, with communications on the subject; for although further and more extensive trial with it is necessary, in order to establish its value in some of the diseases in which it is alleged to have proved serviceable, yet we are safe in saying that it seems to be adapted in an especial manner to the *Acute Phlegmasiæ*, generally."

We have, on another occasion, (vol. xxv., page 109, of this journal) taken the opportunity to bring forward Dr. Norwood's statements with regard to the curative properties of *Veratrum Viride*, and then published his formula for the tincture from the *Southern Medical and Surgical Journal*, January, 1853, which consisted of eight ounces of the root in sixteen ounces of alcohol .835 sp. gr. macerated two weeks and expressed. It now appears that Dr. Norwood's preparation proves ineffectual unless *he* prepares it, and that his claims as a *pharmaceutist* are upheld by one of the most prominent medical journals of this country, as above. As addressed to Southern medical practitioners the above article may not be considered very objectionable; but when it is known that Dr. Norwood has the tincture prepared for him "*at the North*," and that he has copyrighted his labels (one of which is before us) and has placed the general agency of his tincture in the hands of a house largely engaged in the preparation and sale of secret medicines, we cannot but look upon the notice of the Charleston journal as abetting a species of quackery, which, like McMunn's Elixir, and other similar preparations, is not less quackery because the active ingredient is known. Dr. Norwood, as a citizen, has a perfect right to make and sell his tincture, and to seek a monopoly of its sale, but if he does so under the declaration that it is *peculiarly* valuable, whilst the recipe for making it has been published by himself, he not only cannot expect to retain the position of a disinterested member of the medical profession, but by thus upholding the spirit of quackery, however unintentionally, he runs the risk of being classed with those physicians who have sold their professional birthright for a mess of pottage.

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PROFESSOR AGASSIZ AND THE FISHES OF THE UNITED STATES.—Professor Agassiz, having been engaged for sometime in preparing a work on the *Natural History of the Fishes of the United States*, is desirous of getting specimens of the fish in all the rivers, creeks, lakes and ponds of the interior, as well as of the inlets and bays of the coast, that he may the more effectually study

their characters, and compare the same species from different localities. He has issued a circular of invitation, accompanied with directions for putting up the specimens so as to keep well. All those persons who feel disposed, from their interest in science, to promote the professor's object, will do well to address a note to "L. Agassiz, Professor of Zoology, &c., Cambridge, Massachusetts," when he will forward them the necessary directions.

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MASSACHUSETTS COLLEGE OF PHARMACY.—We are glad to learn that our Boston brethren are awake in regard to providing the means of education for their assistants and apprentices, as will be seen by the following extract from the *Boston Medical and Surgical Journal* of December 7th,—“A course of scientific lectures, under the patronage of this important institution, at the Medical College, in this city, to be delivered twice a week, has been commenced. Every apprentice or assistant in an apothecary or drug store, throughout the city, should have the privilege of attending. They would thus become scientifically familiar with the exact medicinal character of the articles in which they deal, and the public would be more secure against a repetition of those fatal mistakes that have been made by selling overdoses of medicines, as well as poisonous drugs, the specific effects of which are not always known to clerks. Physicians should give to the College of Pharmacy, in Boston, the whole weight of their influence.”

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NEW YORK JOURNAL OF PHARMACY.—The Editor announces that “with the present number, the Journal ‘published by authority of the College of Pharmacy of the City of New York’ terminates. When it again appears—and if the contemplated arrangements are carried out, this will be after the regular monthly interval—the College will no longer be even nominally responsible for its contents or its pecuniary obligations.”

The course of the New York Journal of Pharmacy has thus far been dignified, straightforward, and honorable. We had anticipated a longer life for it in its primary form, as the organ of the New York College, yet there is no good reason why, as an independent Journal, it may not greatly flourish and bear much and good fruit to the credit of American Pharmacy.

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*The Electro-Magnetic Telegraph: with an historical account of its rise, progress, and present condition. Also, practical suggestions in regard to insulation, and protection from the effects of lightning; together with an APPENDIX containing several important telegraphic decisions and laws. By LAWRENCE TURNBULL, M. D., Lecturer on Technical Chemistry, at the Franklin Institute of the State of Pennsylvania. Second edition, revised and improved. Illustrated by numerous engravings. Philadelphia, A. Hart, 1853, pp. 264, octavo.*

We have to acknowledge the receipt of this interesting volume from the author. But a few years have elapsed since all were struck with amaze-

ment at the astounding fact that Morse had literally annihilated distance by the powers of this invention. Its novelty has now worn away: and we talk of the news by telegraph as we were wont to do of the postal mail; but in proportion as we become familiarised with the results do their importance become essential with our daily wants. Dr. Turnbull's book explains the mysterious powers of this great wonder and servant, and any of us can now look into its construction. The book is "gotten up," in a manner very creditable to the publisher.

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PEREIRA'S MATERIA MEDICA.—It is with pleasure we announce that the second and last volume of this important work is about to issue from the press of Messrs. Blanchard & Lea. It will be ready about the 1st of Jan. The additions by the author embrace nearly 500 pages, and as Dr. Pereira revised the greater part of the sheets of the last English Edition before his death, for the American Publishers, and as they have also been brought out under the able superintendence of Prof. Carson, we are justified in stating that the American Edition of the work will be the best extant. From a hasty examination of the sheets we believe that great pains and expense have been bestowed by the Publishers to bring out the volume in the best manner. Every apothecary and druggist should possess the work, not only as an encyclopedia of Materia Medica for reference in their own business operations, but for the benefit of their assistants and apprentices.

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ELLIS'S MEDICAL FORMULARY.—We have received a copy of the New Edition of this popular work brought out under the editorial supervision of Prof. Robert P. Thomas, of the Philadelphia College of Pharmacy, but too late for notice in this number.

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OBITUARY.—LEOPOLD GMELIN.—In the last number we announced the death of this eminent chemist. His family has labored during four generations for chemistry. Leopold Gmelin was born at Gottingen on the 2d of August, 1788. In 1804 he attended the Lyceum at Gottingen, and also his father's lectures on mineralogy. He graduated in medicine about 1811. He afterwards visited Italy, Switzerland and Paris. In 1813 he was elected Professor of Chemistry at Heidelberg, and continued in that position for near forty years. In 1850 his infirm health caused him to resign his academical duties, though he continued his literary labors, yet in 1852 he gradually succumbed to a tedious disease of the brain, which undermined his mental powers, and after a severe illness he died on the 13th of April, 1853.

Gmelin is described to have been distinguished for his fine physical frame. "On his firm, powerful body arose the characteristically beautiful head, of noble expression, which was adorned with an abundance of snow white hair, an ideal bust for the sculptor." His manners were unassuming, his countenance firm, earnest and bright, and his language marked with

plainness and precision, except in the genial hour of the social circle, when his exquisite wit shone out.

Gmelin's chemical discoveries were several, among which was the red prussiate of potash, the discovery of which was instrumental in bringing over Berzelius to the modern theory of chlorine. His great labor, however was his "Handbuch of Chemistry," a work in which he has grasped all that has been done by others, and arranged it in order. For such a task he had a thorough technical knowledge, a universal acquaintance with languages, a restless industry, a tenacity of purpose which shrank from no difficulties, and a strength of memory which served him on all occasions. That which renders his Handbook so incomparable, may be comprehended when we recollect that it gives the kernel of every chemical research with such faithfulness and completeness, as to replace directly the original treatise in many cases.—(*Annals of Pharmacy*.)

The new edition of this work, which is in course of translation and publication by the Cavendish Society, was not completed at his death, yet so nearly that it will be finished by the help of others from his papers.

AUGUSTE LAURENT.—M. Laurent, one of the most eminent of the modern French chemists, and the author of the *nucleus theory* of organic chemical constitution, died at Paris on the 15th of April last, in the forty-sixth year of his age. He was earnest in the pursuit of science under the discouragements of a limited income, and too disinterested to seek pecuniary benefit from his discoveries. "His life was a constant combat with circumstances," says M. Nickles, *Silliman*, July, 103, "and hence instructive to the moralist and philosopher. If ever a man elevated himself by the force of genius and perseverance, such pre-eminently was Laurent, to whom every thing was denied, and who made his *chef-d'œuvre* out of nothing!" His fundamental principle was, "That *form or arrangement has often more influence on properties than matter itself*—a principle which has served as the guiding thread in his researches, even to the theories of *substitution*, of *hemimorphism* of *isomeromorphism*, and of *crystalline types*, these in fact being corollaries from this principle."

ADRIEN DE JUSSIEU.—Prof. Adrien de Jussieu, the son and successor of A. L. de Jussieu (author of the *Genera Plantarum*,) and the grand nephew of Bernard de Jussieu, the correspondent of Linnæus, and the first to sketch the Natural System of Botany, died on the 29th of June, at the age of 56 years. From Dr. Gray, in *Silliman's Journal* for Nov., we learn that he had been in bad health for several years, and was carried off by a cancerous affection of the stomach. With him closes the illustrious line of the Jussieus, which for more than a century has been dominant in botany. M. de Jussieu was himself one the soundest and most learned botanists of the age, and a most estimable man. He was President of the Academy of Sciences at the period of his death.

# CLASS OF THE PHILADELPHIA COLLEGE OF PHARMACY, FOR THE THIRTY-THIRD SESSION, 1853--4.

*With the Localities from whence the Students came and a List of their Preceptors.*

PHILADELPHIA COLLEGE OF PHARMACY.—We present below a List of the Class of the School of Pharmacy of the present Session, which numbers 98. The gradual increase which has occurred since 1849-50, is a gratifying indication of greater attention being directed towards Pharmaceutical Education. Of the 98 Students but 42 are from Philadelphia. Of the remainder, 25 are from other parts of the State of Pennsylvania, and 31 from various parts of the Union and beyond its limits.

MATRICULANTS.	TOWN OR COUNTY.	STATE.	PRECEPTORS.
Alexander, Maurice W.	Philadelphia,	Pennsylvania,	W. B. Webb.
Armstrong, James A.	"	"	— Helmbold.
Arthur, Daniel Y.	Frankford,	"	E. B. Garrigues.
Bakes, Wm. C.	Philadelphia,	"	Durand & Tourtelot.
Bancroft, Joseph W.	"	"	Gilbert, Wentz & Co.
Banes, John W.	Cuba,	West Indies,	
Barr, Thomas H.	Terre Haute,	Indiana,	D. & E. Parrish.
Bassett, William H.	Wilmington,	Delaware,	C. Ellis & Co.
Bispham, James L.	Philadelphia,	Pennsylvania,	Bullock & Crenshaw.
Bickley, Mortimer H.	Chester,	"	J. M. Allen.
Bond, William J.	Philadelphia,	"	G. S. Hobensack.
Bower, Henry C.	"	"	G. W. Carpenter & Co.
Broughton, John	Norfolk,	Virginia,	Bullock & Crenshaw.
Canon, Joshua	Mansfield,	Ohio,	Harris, Hale & Co.
Carroll, Augustus D.	Wheeling,	Virginia,	C. Ellis & Co.
Chapin, Wm. C.	Philadelphia,	Pennsylvania,	"
Chenoweth, J. Thomas	Cincinnati,	Ohio,	Charles S. Rand.
Clark, Thomas M.	Gloucester Co.,	New Jersey,	Wetherill & Brother.
Cox, Richard S.	Binghampton,	New York,	Robert C. Brodie.
Cummings, William T.	Philadelphia,	Pennsylvania,	Harris, Hale & Co.
Dickson, John M.	"	"	A. W. Gayley.
Dillard, Robert K.		Alabama,	D. & E. Parrish.
Dunton, Jacob	Philadelphia,	Pennsylvania,	Charles Ellis & Co.
Eggert, Charles H.	Bethlehem,	"	F. L. John.
Emanuel, Louis M.	Delaware Co.,	"	Linn, Smith & Co.,
Epting, Charles W.	Pottsville,	"	F. Klett & Co.
Ewen, George	Newburgh,	Indiana,	John Bringham.
Fairthorne, Robert		England,	Bradford Ritter.
Gaillard, Edward	Philadelphia,	Pennsylvania,	Alfred Tathem,
Garwood, Eli B.		New Jersey,	J. Lewis Harder.
Gerhart, Samuel	Philadelphia,	Pennsylvania,	Dr. George Bley.
Good, Joseph R.	Berks Co.,	"	Wm. Hodgson, jr.
Green, jr. Traill	Easton,	"	Henry C. Blair.
Griffith, J. Clarkson	Winchester,	Virginia,	Benjamin J. Crew.
Guthrie, jr. Joseph T.	Philadelphia,	Pennsylvania,	Dr. W. F. Patterson.
Hance, Edward H.	"	"	Gilbert, Wentz & Co.
Hancock, Charles W.	Belmont,	"	Jenks & Ogden.
Harris, Levi H.	Philadelphia,	"	G. W. Vaughan.
Hart, James H.		Ireland,	Thomas Gegan.
Hazleton, William		New Jersey,	French & Richards.
Hester, Jacob	Trenton,	"	R. Shoemaker & Co.
Himes, Thomas J.	Shippensburg,	Pennsylvania,	Daniel S. Jones.

MATRICULANTS.	TOWN OR COUNTY.	STATE.	PRECEPTORS.
Hoffecker, James		Delaware,	Tristram Needles.
Hooper, John H.	Cambridge,	Maryland,	Dr. S. Chamberlain.
Jacoby, David S.	Sumneytown,	Pennsylvania,	Breinig, Fronefield & Co.
Kearney, Wm. H. Z.	Philadelphia,	"	A. Wynkoop.
Kelly, Edward B.	Lebanon Co.,	Pennsylvania,	Johnson, Holloway & Cowden.
Lancaster, Thomas	Falls of Schuylkill,	"	Samuel Simes.
Lawall, Edmund D.	Allentown,	"	James N. Marks.
Leamy, James	San Francisco,	California,	Thomas S. Wiegand.
Lemberger, Joseph	East Hanover,	"	Dr. J. P. Fitler.
Leslie, Henry W.	Mauch Chunk,	"	Robert England.
Lewis, jr. David	Philadelphia,	"	D. C. Harker.
Leuchsening, H.	Havana,	Cuba,	Bullock & Crenshaw.
Luch, Albert P.	Bethlehem,	Pennsylvania,	Dulles Earle & Cope.
Markley, George H.	Lancaster,	"	Jesse Williamson.
Martin, Dewees J.	Allentown,	"	W. W. D. Livermore.
M'Bride, James	Montgomery Co.,	"	E. & C. Yarnall & Co.
M'Fee, George W.	Philadelphia,	"	John Horn.
Merritt, Alfred C.	Salem,	New Jersey,	Browning & Brothers.
Miller, William J.	Philadelphia,	Pennsylvania,	Beates, Baker & Co.
Mittnacht, Henry	Baltimore,	Maryland,	Caleb H. Needles.
Morell, Charles	Philadelphia,	Pennsylvania,	Henry A. Bower.
Morgan, David U.	"	"	Miller & Tyler.
Morton, jr. Jeremiah	Culpepper,	Virginia,	Robert England.
Paletorp, jr. John H.	Philadelphia,	Pennsylvania,	Thomas P. James.
Pancoast, Dillwyn P.	Mullica Hill,	New Jersey,	Joseph C. Turnpenny.
Paynter, Woodman S.	Philadelphia,	Pennsylvania,	Gilbert, Wentz & Co.
Pedrick, Charles W.	Portsmouth,	Virginia,	Jos. A. M'Makin.
Penrose, Thomas N.	Philadelphia,	Pennsylvania,	Dr. Angney.
Perot, Elliston L.	"	"	C. Ellis & Co.
Pyle, Cyrus	Chester Co.,	"	H. C. Blair.
Reichert, John E.	Philadelphia,	"	George C. Bower.
Rittenhouse, Henry N.	"	"	W. Hodgson, jr.
Robbinz, Alonzo	"	"	John W. Simes & Sons.
Rohrbacher, Frederick	Philadelphia,	"	Robert Nebinger.
Ruch, John H.	Pottsville,	"	Wetherill & Bro.
Shick, Andrew J.	Philadelphia,	"	Bullock & Crenshaw.
Shinn, James T.	"	"	C. Ellis & Co.
Siddall, Frank H.	"	"	John C. Baker & Co.
Siddall, George R.	Madison,	Indiana,	J. Crawford Dawes.
Stackhouse, David L.	Bucks Co.,	Pennsylvania,	Thomas J. Husband.
Stanhope, William B.	Wilmington,	Delaware,	J. Lewis Crew.
Steever, Henry C.	Philadelphia,	Pennsylvania,	Frederick Brown.
Stevenson, Thomas	"	New Jersey,	John C. Baker & Co.
Taylor, Edgar G.	Philadelphia,	Pennsylvania,	Caleb H. Needles.
Thompson, William H.	"	"	Charles Shivers.
Ulmer, George W.	"	"	Joseph H. Brooks.
Uhler, Harry N.	"	"	Dr. George Uhler.
Verner, Chittick	"	Ireland,	Naval Asylum.
Wainwright, Clement R.	Philadelphia,	Pennsylvania,	John M. Maris & Co.
Watson, Charles	"	"	E. & C. Yarnall & Co.
Wenzell, Wm. T.	St. Louis,	Missouri,	D. W. P. Vasey.
Wetherill, J. Bloomfield,	Philadelphia,	Pennsylvania,	Thomas P. James.
Whitney, James S.	"	"	C. Ellis & Co.
Wilson, Henry M.	Holmesburg,	"	Dr. W. T. Taylor.
Wyeth, John	Harrisburg,	"	Henry C. Blair.
Young, Joseph E.	Philadelphia,	"	William Procter, jr.

# THE AMERICAN JOURNAL OF PHARMACY.

MARCH, 1854.

## REMARKS ON CHINESE PHARMACY.

By GUSTAVUS L. SIMMONS, of Sacramento, California.

Having often read with interest, articles concerning the "State of Pharmacy" in other countries than our own, I have thought that a few observations I have been recently enabled to make in regard to the medical and pharmaceutical knowledge of the Chinese, might not prove uninteresting—especially as this ancient and singular race is at present attracting the attention of the civilized world.

We have often read and heard that they had no regular system of medical practice, but depended for a cure, when sick, on incantations and superstitious orgies, similar to those practiced by many of the Indian tribes of North America. This idea we believe to be untrue, as it is at total variance with our own observations.

The city of Sacramento is the great interior depot for the Chinese in California. Here a portion of the town is wholly occupied by them, in fact presents a miniature of a Chinese city, and as such is often visited by persons who desire to become better acquainted with the habits of this strange people.

Hearing an apothecary was located there, I resolved to make him a visit, and accordingly recently started on what I at first supposed would be a fruitless errand. Fortunately, at the onset, I met with an intelligent Chinaman, who had been partially educated by the missionaries, and who could quite readily express himself in the English language.

This gentleman very kindly took upon himself the task of accompanying us, and explaining all that became necessary. The exterior of the shop we visited was in no wise dissimilar to those of other occupations. A sign over the entrance alone gives the passer by a knowledge of the business followed within.

The sign, in the present instance, must have cost the artist who executed it considerable labor. All of the complicated Chinese characters were deeply graven in the wood of which it was com-



posed ; gold and bright vermillion appeared in abundance ; and a rich silk drapery, arranged in a tasteful manner, hid the edges from view.

The inscription when translated read : “ *Tung Fuk Tung*,” and was the name of the “ *Teacher* ” with whom the proprietor of the shop had studied for a term of years.

On entering we were struck with the absence of fluid preparations, and throughout our examination we discovered but one article of this kind, and not a single mineral preparation.

A narrow but very high counter, a range of gaudily painted drawers, wide shelving, and sundry Chinese stools, constituted the shop furniture. The shelves were mainly occupied with bundles, containing roots, herbs, &c. ; and it will astonish many when they learn that we counted over eleven hundred bundles, each marked with a different character, and all brought from the Celestial Empire, thus proving that the “ *Materia Medica* ” of the Chinese is in nowise deficient in the number of remedies. The drawers were divided into six compartments ; unique porcelain “ *galley pots* ” occupied the shelving immediately over them ; and above, ranged in regular order, were fancy packages, containing very diminutive bottles of strong ol. mentha piperita, and a peculiar kind of musk artificially manufactured. We also saw various compounds with long written papers attached, the true nature of which we were unable to determine, but from the remarks of our companion, we strongly suspected that even the “ *Celestials* ” were not free from the “ *cure alls* ” and “ *patent nostrums* ” which flourish so greatly in the United States. The *mortars* used in compounding, are composed of porcelain and iron, the shape being somewhat different from those manufactured by the English.

For powdering, an exceedingly uncouth instrument is used. It is made of iron, about four feet long, and the inside resembling a whale boat with a depressed center and elevated ends. A heavy iron wheel hung on a wooden axis is made to revolve in the channel, the motive power being the feet of the operator. This quickly and easily reduces most substances to a powder.

Various sizes of knife blades arranged on the end of an elevated trough, in a similar manner to the old style of *straw cutters* are in use for cutting up roots and barks ; also large shallow baskets for drying purposes.



The *scales* show the great antiquity of the people. They still disdain to use other than those which have been in use for centuries. These have but a single plate and a long beam, the weight sliding on this last, similar to the old fashioned *steelyard*. Many however are of fine workmanship, and in the hands of a skilful person prove very accurate.

For writing their prescriptions, labelling, and in fact for all kinds of writing, they use the camel's hair pencil and India ink. Each store has these laid on a small stone slab, and rice paper by the side for immediate use.

We now come to the nature of the remedies given by Chinese physicians, for the cure of the sick. A Chinaman always prides himself on the ancient origin and unchangeableness of his people, and it is probable that but few articles have been added to their "Materia Medica" for many hundred years. Unfortunately, out of the numerous articles we examined, but very few were familiar, and the similitude of uses with our own, induced us to copy them. They were *Panax*; *Mentha viridis*; *Mentha piperita*; *Cinnamomum*; *Glycyrrhiza radix*; *Scilla*; *Senega*; *Ulmus cortex*; *Rheum*; *Resina*; *Maranta*; *Carbo ligni*; *Ficus*; *Camphor*; *Moschus*; *Anthemis*; *Hordeum*; *Aurantii cortex*; *Crocus*; dried snakes, and dried flies.

The *Ulmus*, *Maranta* and *Hordeum*, are used as articles of diet for the sick; the *Cinnamomi*, *Aurantii cortex*, *Glycyrrhiza*, &c., for flavoring and disguising medicines of a nauseous taste; *Camphor* as an aromatic, and decoctions of *Senega* and *Scilla* as expectorants. The dried snakes are only for external use in rheumatic pains, but the dried flies, which greatly resemble the "*Cantharis vesicatoria*" of the U. S. P. we were repeatedly assured were given in cases of *gonorrhœa*, and were considered in that disease as a specific, thus proving their acquaintance with the diuretic properties of the article.

Nearly all medicines are given in the form of a decoction, and each prescription usually contains from twelve to twenty articles.

During sundry visits to our Chinese professional brother, we have seen him compounding, and we have never noticed less than twelve articles in any of the prescriptions he has compounded while we were present.

Through his politeness, we were favored with a written recipe for fever and ague, which he compounded for us, and which presents a singular appearance to the American eye. We have forwarded a portion to the editor of the *Am. Journ. of Pharmacy* for inspection.

*Sacramento, Cal., Jan. 1854.*

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### PRACTICAL NOTES ON PHARMACY.

BY JOSEPH LAIDLEY, PHARMACEUTIST, RICHMOND, VIRGINIA.

Having frequently heard complaints against the officinal formulæ for some of the syrups, I have thrown together a few notes in reference to some of the more unstable members of this class of preparations such as senna, senega, ipecacuanha, orange peel and hive syrup, and will attempt, in this paper, to point out the means by which these preparations may be rendered more permanent than they now usually prove to be; and in connection with this subject, to suggest a plan of making handsomer syrups of tolu and ginger than the officinal formulæ afford; prefacing the whole with some general observations on this class of medicines, and the causes of the frequent failures to prepare them properly. Many persons on attempting to prepare the syrups of the Pharmacopœia fail, because they do not *comprehend* the processes, and do not consider what their object in making the preparation should be. A medicated syrup should contain the active principle of the drug in such a form as to render it permanent for a reasonable length of time; if persons do not succeed in accomplishing this, it is usual to change the formula as being imperfect. I have heard complaints of this character from persons, who in preparing syrups, used only *twelve* pounds (avoirdupois) of sugar to one gallon of liquid. Of course such a syrup would soon ferment, unless the deficiency of sugar were compensated for by alcohol, or some other preservative agent. That there is room for improvement in some of the formulæ of the Pharmacopœia, no one will deny, but we must remember that it is intended to be the guide of a class of persons which embraces all degrees of intelligence and attainment, and, consequently had to be adapted to the knowledge and means of this heterogeneous mixture, rendering, in some instances, a perfectly scientific process out of the question, and for the sake of securing

uniformity giving one far inferior to what might have been, if all were *qualified* to practice the improvements of the times. If a work of this nature be not practical in its character, it is useless as a standard. As a standard, it should be followed *strictly* by those who are *unacquainted* with better formulæ; those who are familiar with improved processes are at liberty to employ them if the resulting preparations are similar to those of the Pharmacopœia. It is hoped that the following observations may prove practically useful to some of the readers of the Journal, some of whom I know have met with difficulties in preparing and preserving these medicines.

The *stability* of syrups depends mainly on their composition and consistence, the temperature and the amount of their exposure to the air.

The *composition* of a syrup is an important point, when considered with reference to its stability; to secure permanency in medicated syrups, it would be better to admit no ingredients except the active principle of the drug and simple syrup. Syrup of poppies when prepared from a decoction of the capsules very soon spoils, whereas, a preparation similar in medicinal efficacy, made by dissolving sulphate of morphia in simple syrup, keeps for an indefinite length of time.

But while in the instance just cited, morphia answers well; there are some drugs which, even if it were desirable to exhibit in this form, we are as yet either unacquainted with their active principles or with any practicable method of isolating them, as, for instance, rhubarb. But this is not necessary; it will answer our purpose if we exclude from syrups those substances which either induce, or are particularly liable to undergo fermentation. The substances of this character most commonly met with are albumen, starch, gum, mucilage, pectin, coloring matter, &c. Some of these exist in all roots, barks, &c.

Ipecacuanha contains a large amount of gum, starch and coloring matter; senna, albumen and mucilage, &c.; squills, gum, &c.; rhubarb, starch and gum; ginger, starch and gum; senega, gum, albumen, pectin, &c.; wild cherry bark, starch, &c.

These substances impart no medicinal property to syrups, and their presence in them frequently gives rise to fermentation; consequently, it should be the object of formulæ for syrups to embody

in the latter the active matter, and to exclude the above mentioned substances.

The consistence of syrups is a matter frequently too much neglected. The Pharmacopœia directs them to have the specific gravity 1.261 when boiling, and 1.319 when cold. This may be readily ascertained by an hydrometer,\* the specific gravity bottle or, by observing the boiling point which, for syrup of the proper density, is 221° F.

Temperature exercises an important influence on syrups ; frequently a syrup which during the summer season is of the proper consistence, is rendered by the diminished temperature of winter so dense that the sugar begins to crystallize, and, if the crystals are not removed, the crystallization will proceed until the syrup has not enough sugar left to preserve it, and fermentation sets in.

The preservation of these medicines is attended with difficulty, unless indeed some foreign preservative agent be added. If, however, the fermentable substances before mentioned be excluded, and the syrup be of full saccharine strength and bottled, it will require no other precaution than that of guarding against too sudden or extreme changes of temperature, and unnecessary exposure to the atmosphere.

The practice of adding alcohol, or of *not evaporating* all of it from a tincture of which the syrup is sometimes made, is therapeutically so objectionable, especially, when the syrup is used in cases attended with inflammation, that it should never be done. Hoffman's anodyne is not liable to the same objection, and as the quantity necessary is small (1 part by measure to 75 of syrup) it might sometimes be added advantageously.

But all syrups may be effectually preserved by introducing them while hot into small bottles, corking securely and sealing ; they should then be kept standing in a cool place. The bottles should be very nearly full otherwise the air enclosed would probably be sufficient to start fermentation. It is worthy of note also, that the exposure of much *surface* to even a small portion of air, is likely to start fermentation ; consequently the practice of laying bot-

\*Hydrometers are sold by Messrs. Haskell, Merrick & Bull, of New York, which give the actual sp. gr. in *figures*. They are in cases of three, which also contains a jar for testing liquids and a chemical thermometer. The instruments are very accurate.

tles of syrup on their sides, is improper, they should be either stood up, or inverted. Last summer a fermentable syrup was introduced while hot into two tall square bottles, nearly filling them; the bottles were corked, sealed and placed, one standing, the other on its side, in a situation where the temperature was about 80–85°. In one, a surface of about three square inches of syrup was exposed to the action of the small amount of air contained within the bottle; in the other about eighteen square inches were exposed, and in a few days the syrup began to ferment, and burst the bottle, while the other remained unchanged until some four or five weeks afterwards when it was uncorked. I come now to the formulæ for some of the syrups.

*Syrup of Ipecacuanha*, as generally prepared, is very liable to spoil, owing probably to the presence of gum and coloring matter derived from the root, and dissolved by the tincture prepared in the first part of the process.\*

An alcoholic tincture of ipecacuanha has not near as much color, nor does it on evaporation yield as much extract as a tincture made with diluted alcohol; showing that there must be some substance which is soluble in the latter, but not in the former menstruum. The liability of the officinal syrup to undergo fermentation, is, probably, owing to the presence of this substance. A syrup of ipecacuanha, which I have found to keep about as well as simple syrup, is made as follows: Eight ounces (Troy) of powdered ipecacuanha are mixed with twelve fluid ounces of alcohol, (sp. gr. .835,) the mixture is allowed to stand 12 hours; sufficient alcohol is mixed in to make it of the consistence of syrup, and the whole introduced into a suitable displacer, in which it gradually settles down as the alcohol percolates; a piece of muslin is laid on the surface, and when it has settled down uniformly, more alcohol is added until the filtered liquid measures half a gallon. The first half pint that comes through is reserved; the remainder is distilled

\*It is not perhaps generally known, that gum is soluble to some extent in diluted alcohol, if gum arabic be allowed to remain an hour or two in diluted alcohol, the liquid filtered, and solution of sub-acetate of lead be added, a copious precipitate is occasioned.

Starch also is soluble in boiling diluted alcohol, which, after cooling and the greater portion of the starch has precipitated, yields, when filtered, a very decided blue color with iodine.

and evaporated to eight fl. ounces, and then added to the reserved half pint, and a fluid extract of ipecacuanha is obtained, of which two fluid ounces represents one ounce (troy) of root.

Eight fluid ounces of fluid extract of ipecacuanha are added to four pints of simple syrup; the mixture is evaporated to three pints, four pints of simple syrup and one pint of water are added, making the whole measure one gallon of syrup of ipecacuanha. If, on the addition of the four pints of simple syrup, the mixture should not be perfectly clear, it may be rendered so by mixing with water the white of one egg, adding it to the syrup, boiling for a few minutes and straining. As thus prepared syrup of ipecacuanha contains very little, if any alcohol, it possesses the medicinal virtues of the drug, and I have never known it to ferment. I have also prepared this syrup very successfully in the manner described for syrups of ginger and tolu, in this paper.

*Syrup of Seneka and Compound Syrup of Squill or Hive Syrup*, according to the experience of most persons, change very soon as ordinarily prepared. But when made by displacement according to the second formulæ for them in the Pharmacopœia, they keep much better. When, however, the menstruum directed in that work is used, the liquid should be boiled and the coagulated albumen separated *before* the evaporation, because the increased density of the liquid, *after* the evaporation, renders filtering difficult. The object of the Pharmacopœia in giving this direction is to secure the removal of *all* the albumen: this is done much more expeditiously by first boiling the liquid obtained by displacement, straining through a felt or Canton flannel bag, evaporating to one half and filtering through paper.

But since gum is a constituent of both squill and seneka, and, by the processes of the Pharmacopœia, remains in the above mentioned syrups, the tendency of which is to render them liable to ferment, and as the separation of the albumen of the seneka is attended with some trouble, and as the displacement process requires much time, when water containing only sufficient alcohol to prevent decomposition of the ingredients during the time occupied in displacing this menstruum, is used, I think alcohol (.835), which obviates all these objections, should be employed as the menstruum. Alcohol is an excellent, perhaps the best solvent of these drugs, does not dissolve the albumen, or other fermentable substances in them,

and displaces much more readily than either the menstruum ordered for these syrups, or *diluted* alcohol. I would recommend, therefore, that these syrups be prepared in the manner suggested for syrup of ipecacuanha; by first preparing alcoholic fluid extracts (from the drugs in *coarse* powder,) and adding them to simple syrup as above described.

*Syrup of Senna* is ordered in the Pharmacopœia to be prepared by digesting the senna, etc. in the water with a gentle heat, ("a temperature between 90 and 100 degrees,") and then, after straining, a syrup is to be made. As thus prepared, it will certainly contain mucilage and most probably albumen; the latter, however, may be removed by boiling and straining, but then the mucilage is left and it soon ferments. The remedy is the same as for the syrup above described.

*Syrups of Ginger, Tolu, and Orange peel.*—Syrups of ginger and tolu, as now prepared by the pharmacopœial formulæ, keep very well, (though the ginger, I am inclined to think, would not be so permanent if the menstruum used for preparing the tincture were not alcohol, which does not dissolve the gum of the root,) and although these syrups are pleasant and efficient, they are not handsome preparations. For the apothecary who wishes them to be not only good medicines but of handsome appearance, the following method will answer:

Take of Tincture of tolu,  $1\frac{1}{2}$  fluid ounces.

Sugar,  $2\frac{1}{2}$  lbs. (troy.)

Water, 1 pint.

Mix the tincture with 1 lb. of sugar in a shallow dish, and evaporate the alcohol with the aid of a gentle heat, (or allow it to evaporate spontaneously,) add the remainder of the sugar, and dissolve it in 12 ounces of the water; with the remaining 4 ounces of water, beat up the white of one egg, add it to the syrup, boil for one or two minutes, and strain through a felt or Canton flannel bag. In this manner a beautifully clear syrup is obtained, which is highly charged with the properties and aroma of tolu.

In the same manner, (but using, of course, the proper proportions of tincture, etc.,) prepare syrup of ginger.

As before mentioned, syrup of ipecacuanha may be elegantly prepared in this manner, using the fluid extract of that drug.

Syrup of orange peel, which, as ordinarily prepared, is a very



unstable preparation, may be advantageously made in the same manner, using a tincture made by macerating 4 ounces (troy) of orange peel for 7 days in 12 ounces of alcohol, expressing, filtering, and adding this to the sugar, etc., as above.\*

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## ON THE PHARMACY OF CIMICIFUGA.

By WILLIAM PROCTER, JR.

Cimicifuga, or black snake root, belongs to the natural family Ranunculaceæ, with black hellebore, aconite, hydrastis, and coptis. Although a prevailing character of the plants of this family is acrimony, exceptions exist as in hydrastis and coptis, which are simple bitters. The cimicifuga appears to hold an intermediate position. Like the coptis it is exceedingly bitter, but in addition to its tonic power it possesses some acrimony and exerts considerable influence over the nervous system with tendency to the brain. In its merely chemical relations it is more analogous to *Helleborus niger* than to any of its congeners. Like that root it contains a large quantity of bitter resin, readily separable; and also a volatile principle, which diminishes by keeping, and appears to be concerned in giving medicinal activity to the root. Unlike *Helleborus*, however, it is not drastic, yet it exercises some influence over the uterus. It is probable that the discrepancies in the testimony regarding its medical powers are due in part to the variable quality of the drug, as well as to the imperfect pharmaceutic treatment which it has undergone preparatory to use. It has been administered in powder, decoction and tincture, but most frequently in decoction, and this prepared at the house of the patient. Too often the root is dispensed imperfectly bruised, or perhaps not at all, and thus treated by ebullition "to get all the strength out," until the resulting decoction is deteriorated. No one thinks of decocting black hellebore, and the old process for the extract with water has been wisely abandoned, the tincture and hydro-alcoholic extract being chiefly relied on. The tincture of cimicifuga is a good pre-

[\* With due deference to the skill of Mr. Laidley, and without being able from positive trial to assert it as incorrect, we cannot agree with him that alcohol of .835 is the proper menstruum for senna, when viewed in reference to the medicinal value of the resulting preparations. (See U. S. Disp. 9th Edit. p. 675.)—EDITOR.]

paration, but is too alcoholic when its use is to be long continued. In view of this, the following recipes for a solid and a fluid extract are offered, as affording to the practitioner the most eligible means of prescribing this drug either in pills or mixture.

*Fluid Extract of Cimicifuga.*—Select sixteen ounces (troy) of recently dried black snake root, reduce it to coarse powder, introduce it properly into a displacer for volatile liquids, and pour on gradually a mixture of one pint of alcohol and half a pint of ether. When the liquid commences to pass, close the orifice so that its passage shall be by drops; and when the menstruum disappears above, immediately add diluted alcohol until the filtered tincture measures a pint and a half. Set this aside in a capsule in a warm place until it is reduced to half a pint, and has lost its ethereal odor. Meanwhile continue the percolation with diluted alcohol until two pints more tincture are obtained. Evaporate this in a water bath to eight fluid ounces, and mix it gradually with the first product so as to avoid as much as possible the precipitation of the resin from the latter. After standing a few hours the fluid extract should be filtered, and if it does not measure a pint add a sufficient quantity of alcohol to make that measure.

If the amount of resin precipitated is considerable, it may be separated by a cloth strainer, redissolved in a little alcohol, and added to the solution, which should then be filtered.

As thus prepared, fluid extract of cimicifuga has a dark reddish brown color, like laudanum, is transparent, and possesses the bitter disagreeable taste of the root in a marked degree.

*Extract of Cimicifuga.*—In making this preparation proceed in the same manner as above described to exhaust the root, and continue the evaporation of the solutions separately until they have a syrupy consistence, mix them, and finish the evaporation with care over a water bath with constant stirring. Eight grains of this extract represent a drachm of the root.

*Macroytin or Cimicifuga Resin.*—The eclectic practitioners attribute the powers of the cimicifuga to this substance. Some have regarded it as having a more decided effect on the cerebral nerves than the root at large. As it is readily obtainable, and can easily be prepared, (see E. Parrish's article, vol. xxiii., p. 329,) by pouring the concentrated alcoholic tincture into water, its medicinal value should be tried by some of our medical men.

## ON SYRUP OF SANGUINARIA.

BY THOMAS S. WIEGAND.

Having been requested to make a preparation of Sanguinaria, which should contain in a small bulk an adequate dose of the root, and at the same time be pleasant to the palate, several experiments were made to ascertain the most desirable formula; the following was adopted as the most consistent with the chemical habitudes of the article, and being at the same time easy of execution, it is hoped that it may be found worthy of adoption by the trade generally.

R. Sanguinaria in coarse powder,	8 ounces,
Acetic acid,	4 “
Water,	5 pints.
Sugar,	2 lbs. troy.

Mix two fluid ounces of the acetic acid with a pint of water, and thoroughly moisten the root with it; after three days maceration transfer to a displacement apparatus, and displace with the remainder of the water previously mixed with the other half of the acetic acid. If the percolation has been carefully conducted, the root will be exhausted. Evaporate by means of a water bath to eighteen fluid ounces, and add to it the two pounds of sugar, form a syrup and strain if necessary.

When thus prepared the syrup is of a deep ruby color, opaque in quantity, but transparent in thin strata, and possessed of a strongly acid and bitterish taste. It has been exhibited in several cases very satisfactorily.

*Philadelphia, Feb. 4th, 1854.*

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ECLECTIC PHARMACY.

In the Eclectic Medical Journal, for January 1854, is an article headed “Official preparations of the United States Eclectic Dispensatory.” About forty years ago, Samuel Thompson, of New England, an energetic but illiterate man, commenced the practice of that system of empiricism that subsequently under the name of Thomsonianism was seized upon by the popular mind, and for a time became the favorite practice of a numerous class of persons, especially among farmers, who, pleased with the idea of being their

own physicians, were not slow in patronizing a scheme that, without collegiate study, offered to give them the knowledge requisite for medical practice. In process of time the crude ideas of the founder were more and more modified by his disciples, the materia medica was extended beyond lobelia and red pepper, and some degree of science, both as regards botany and pharmacy, crept in to their practice, which now included a numerous list of the plants indigenous to our country. The advent from time to time of a regular physician among them brought in an admixture of regular ideas; and at this time, quite a numerous body of men, principally in the West and North, are engaged in the practice of a scheme of medicine and pharmacy which is known as "Eclecticism," or "the Eclectic Practice of Medicine." Depending chiefly on botanical medicines, they do not wholly discard mineral preparations. Although professedly inimical to the mercurials, they employ the salts of iron, zinc and lead, and perhaps others. They have no generally recognized Pharmacopœia or code of receipts, but several works on their materia medica have been published by individuals. They support several Institutions, where their system of practice is taught by lectures in the ordinary manner, by professors with titles quite as formidable as those of our oldest Institutions. They also have several medical Journals in which their views are advocated, and information circulated.

It is a favorite idea with the "Eclectics" to have what they call "concentrated medicines," as active principles, fluid extracts, etc., and this inclination has increased in proportion as they have repudiated Thompsonianism and edged towards regular medicine. A notice of some of those preparations, as podophyllin, macroytin, sanguinarin etc., was published in this Journal by Edward Parrish, (vol. xxiii. page 329.) We will now make a few extracts from what purports to be a list of Eclectic "Official Preparations."

"*Pilulæ Ferri Compositæ*.—Take of carbonate of iron, *one drachm*, podophyllin [impure resin of *Podophyllum peltatum*] *half a drachm*, white turpentine *half a drachm*. Mix well together and divide into thirty pills."

"*Pilulæ Podophyllini Compositæ*.—Take of podophyllin, scammony, gamboge, of each in powder, *one drachm*; triturate well together for half an hour; then add *half a drachm* of castile

soap. Beat the whole together until they are thoroughly incorporated. Divide into one hundred and twenty pills."

"*Pulvis Ipecacuanhæ et Opii. Diaphoretic powder.*—Take of Opium in powder *half a drachm*; Camphor in powder, *two drachms*; Ipecacuanha, in powder *one drachm*; Cream of tartar, one ounce, mix them."

This is the Eclectic Dovers' powder, which is sometimes modified by substituting nitrate of potassa for bitartrate, and lactucarium for opium.

"*Syrupus Phytolacæ Compositus.*—Take of poke root, and root of five-leaf (*Impelopsis quinquefolium*) each coarsely bruised *one pound*, black cohosh root [*Cimicifuga*] coarsely bruised, and sheep laurel [*Kalmia angustifolia*] leaves, each *half a pound*."

Proceed to make into a syrup in the manner directed for compound syrup of sarsaparilla, making one gallon and a half of syrup. Used in syphilis, scrofula and rheumatism. Dose a tablespoonful.

"*Tinctura Hydrastis Composita.*—Take of golden seal [*Hydrastis Can.*] and lobelia, each two ounces; diluted alcohol a pint. Macerate 14 days and filter."

Used as a local application to diseased mucous surfaces.

"*Tinctura Lobeliæ Composita.*—Take of lobelia (herb), blood root, skunk cabbage root, arasabacca and pleurisy root, each coarsely powdered, *one ounce*. Place them in a vessel and cover with boiling water or vinegar, *one pint*, and cover tightly. When cold transfer to the bottle in which it is to be kept, and add alcohol *three pints*. Macerate 14 days and filter.

"This forms an excellent emetic for children and infants, and may be safely used in croup, whooping cough, bronchitis, asthma, convulsions, and in all cases where an emetic is required."

*Lotio Hydrastis Composita.*—Compound collyrium of golden seal. "To a strong decoction of green tea and golden seal, of each, *one pint*; sulphate of iron, gunpowder, and sulphate of zinc, of each, *two drachms*. Let them dissolve, and after decomposition has ceased and the precipitate has subsided, pour off the supernatant liquid."

Used in chronic diseases of the eye.

"*Mistura Cajuputi Composita.*—Dissolve oil of cajuput, cloves,

peppermint, and anise, of each *one ounce*, in rectified alcohol, *four ounces*."

"Used in cholic, cramp of the stomach, or elsewhere, pains in the stomach or bowels, painful diarrhœa, cholera morbus, Asiatic cholera, and in all cases where a stimulant and antispasmodic is required. Dose from *one* to *two* drachms in hot brandy and water, sweetened, or in simple syrup or mucilage of slippery elm. In Asiatic cholera, from *two drachms* to *two ounces* every ten to fifteen minutes, in case of violent spasm. It relieved the pains when all other means failed."

This looks like a misprint—one ounce of essential oil, of which one-fourth is oil of cloves, for a dose!

"*Unguentum Stramonii Compositum*.—Discutient ointment.

Take of the bark of the root of bitter sweet, stramonium leaves, cicuta leaves, deadly nightshade, yellow dock] root, of each *two ounces*. Bruise the roots and leaves and simmer them in spirits; then add lard *one pound*, and gently simmer till the leaves are crisped. Then express through linen, and add Venice turpentine, *two ounces*."

"This ointment is exceedingly valuable in discussing scrofulas, indolent, and all glandular swellings. It should be rubbed on the part about thirty minutes at each application; after which cover the part with cotton, and secure it with a proper bandage."

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#### SYRUPUS FERRI PHOSPHATIS COMPOSITUS.

By THOMAS S. WIEGAND.

Within about twelve months, the attention of the pharmacists of this city has been directed to the phosphatic salts of iron, lime, potassa and soda, by the numerous prescriptions of some of our physicians for combinations of two, three, or all of them, in pills, mixtures, or syrups. In volume xxv, page 411, of this Journal, Mr. A. B. Durand published a formula for syrup of phosphate of lime. Since then, a phosphatic syrup, embracing in its composition the phosphates of iron, lime, potash and soda has been introduced to notice by several apothecaries; and as the formula has not as yet transpired, the following recipe for an analogous preparation, may be acceptable to many of the readers of the Journal.

Take of Protosulphate of iron, four drachms and two scruples.

Phosphate of soda (crystallized) seven drachms and a half.

Phosphate of lime (recently precipitated,) four drachms.

Glacial phosphoric acid, one ounce.

Sugar, in coarse powder, eight ounces.

Water a sufficient quantity.

Dissolve the sulphate of iron, and five and a half drachms of the phosphate of soda, severally, in three fluid ounces of the water, and mix the solutions. Wash the precipitated phosphate of iron with (cold) boiled water, mix it with the phosphate of lime and half a pint of water in a porcelain capsule, apply heat, gradually add the phosphoric acid, continuing the heat until a clear solution is obtained, and dissolve in it seven ounces (Troy) of the sugar. Then dissolve the phosphate of potash, two drachms of the phosphate of soda, and an ounce of sugar, in a fluid ounce of water, acidulate the solution with phosphoric acid, and add it to the syrupy solution first obtained. A slight cloudiness is occasioned by mixing the solutions, which may be entirely removed, and the syrup rendered permanently transparent, by adding forty drops of hydrochloric acid.

Each teaspoonful of this syrup contains about one and two-fifths gr. of proto-phosphate of iron, two and a half grains of phosphate of lime, one and one-fifth gr. each of the alkaline phosphates, and four and a half grains of free phosphoric acid, which may be considered the dose.

The preparations now in use, are colored with cochineal and flavored with orange peel, which render them less disagreeable. The syrup now offered may be so treated by rubbing up six grains of cochineal with a little sugar, and adding ten drops of the oil of orange peel and adding the mixture to the syrup and filtering.

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#### ADDITIONAL REMARKS ON THE PHARMACY OF THE PHOSPHATES.

BY WILLIAM PROCTER, JR.

There are several ways in which phosphate of iron and other phosphates may be prescribed extemporaneously in solution, and the proportions varied to suit particular cases. The therapeutic results from the use of so much free phosphoric acid, have hard-



ly yet been fully investigated; and it is worthy the attention of physicians who prescribe the phosphates in this manner, to observe the relative effects of treatment by phosphatic mixtures, with and without the free acid; more especially in reference to the excretions.

The following recipe will yield an acid solution of the phosphates of protoxide of iron and soda, viz.

Take Protosulphate of Iron, (cryst.)	a drachm.
Phosphate of Soda, (cryst.)	two drachms,
Glacial Phosphoric Acid,	two scruples.
Syrup of Orange peel,	two fluid ounces.
Water,	two fluid ounces.

Triturate the salts with the acid in a wedgewood mortar until a syrupy liquid is produced by their reaction, then gradually add the water, filter the solution through a piece of lint, or muslin, and mix it with the syrup. Of this mixture the dose may be a dessert spoonful, or a table spoonful, according to circumstances.

The reactions that occur when the solid ingredients are triturated together, are the production of phosphate of iron and sulphate of soda, and the solution of the former by the free phosphoric acid, the liquefaction arising from the water of crystallization of the salts, both of which are strongly hydrated. The presence of the small amount of sulphate of soda formed may be looked upon as unimportant, yet it would be more appropriate to employ the proto-chloride of iron as in the following formula, when the resultant would be common salt instead of sulphate of soda.

Take of Proto-chloride of Iron, (in crystals,)	3j.
Chloride of Calcium, (fused,)	3iss.
Phosphate of Soda, (crystallized,)	3vij.
Phosphate of Potassa,	3j.
Glacial Phosphoric acid,	3iij.
Syrup of Lemons,	
Distilled water, of each	four fluid ounces.

Triturate the chlorides of iron and calcium, six drachms of the phosphate of soda, and the phosphoric acid, together with a little water, until a homogeneous liquid is obtained, and then add the rest of the water gradually. Dissolve the phosphate of potassa

and the remainder of the phosphate of soda in the syrup, and add it to the first solution, and mix.

The result is a syrupy, acid, saline liquid, holding a portion of gelatinous phosphate of lime in suspension. This may be entirely dissolved by using more phosphoric acid, or by adding a little hydrochloric acid, as suggested by Mr. Wiegand.

The reactions that occur in the above formula are, first, the productions of phosphate of lime, phosphate of iron, and chloride of sodium; next, the immediate solution of the two first through the agency of the free phosphoric acid. When the syrup containing the phosphates of soda and potassa is added, a portion of the free acid is attracted by them, and a small part of the phosphate of lime is precipitated in a hydrated form.

Sulphate of iron may be substituted for the chloride in the above formula by first triturating the soda salt and chloride of calcium alone with a little water, till double decomposition ensues, then adding the *sulphate* of iron and again triturating, and lastly the phosphoric acid. By observing this order no sulphate of lime is formed, and the mixed hydrated phosphates of lime and iron at first formed are readily dissolved by the free acid. When sulphate of iron is used, of course both sulphate of soda and chloride of sodium exist in the preparation.

The phosphates of iron and lime of commerce are often so granular and dense that their solution and absorption in passing along the alimentary canal must be much interfered with. This difficulty may be avoided, when the free phosphoric acid is objectionable, by presenting the insoluble phosphates in a hydrated form, thus :—

Take of Proto-Sulphate of Iron, (cryst.,)	ʒij.
Chloride of Calcium, (fused,)	ʒiss.
Phosphate of Soda, (cryst.,)	ʒvij.
Syrup of Ginger,	

Distilled water, of each four fluid ounces.

Triturate the chloride of calcium with the phosphate of soda and three fluid ounces of the water, till the decomposition is complete, and a smooth mixture is obtained; then add the syrup, and finally the sulphate of iron previously dissolved in a fluid ounce of the water.

The resulting mixture consists of the hydrated phosphates of iron and lime, with about two drachms of sulphate of soda and a

little common salt, the whole rendered palatable by the syrup which also tends to suspend the insoluble salts and to prevent the per oxidation of the iron salt.

These formulæ are offered, not as regular preparations, to be kept prepared, but as conveying some hints as to a manner of preparing the phosphates extemporaneously for administration in solution or mixture, very favorable to their therapeutic action.

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### AMERICAN PHARMACY.

BY EDWARD PARRISH.

Among the Druggists in the United States, who in number amount to some thousands, there are individuals of every grade of qualification; *some* educated chemists, *many* men of moderate attainments in science, and *more* whose knowledge is chiefly confined to the art of making money. There is no less variety among these in the extent of their business and the success attending its prosecution. There are a few who sell annually to the amount of 100,000 dollars, but many more who by unceasing application sell scarcely 2000 dollars worth in a year. These druggists comprise individuals who are clothed in fine linen and fare sumptuously every day, and others who answer to the description of the lean, half starved apothecary.

Notwithstanding these wide differences in scientific, social and business position, this whole class of "druggists" or "apothecaries" or "chemists and druggists," as they are variously called, have certain interests in common which constitute a natural bond of union between and among them, and call for a fusion of their diverse elements of strength into one professional fraternity, self-protective as regards its own interests, and eminently humane and beneficent as regards the public at large.

As the object of the present series of essays is to point out some of the advantages to be gained by a more complete organization of our profession and to give as far as possible an impetus to the awakening spirit of Pharmaceutical reform, it will be a fitting commencement to specify in a few words the peculiar position, duties and responsibilities that pertain to our business, and require that it should be guarded by special precautions from the influences to which ordinary trades are subject.

The close connexion of the business of druggist and apotheca-

ry with the public health, separates it from exclusively mercantile trades, and requires of its votaries a more accurate acquaintance with exact science and a higher tone of professional bearing than pertains to the mere business man. We may thus sum up these peculiar duties.

1st. To secure to the public a drug market, comprising every known substance used in the cure of disease, whether of vegetable, animal, or mineral production, of foreign or domestic origin, each containing as perfectly preserved as possible its natural curative principles, and fully realizing the promise of nature in its bestowment on man.

2nd. To modify by artificial processes, to prepare and to combine together these drugs, so as to adapt them to use in the treatment of disease whether under the direction of the physician or otherwise.

3rd. To exert the influence pertaining to his position, intermediate between the physician on the one hand, and the people on the other, so as to strengthen public confidence in the *science* of medicine, and to unveil the pretensions of quackery. It is peculiarly his place to impart a correct knowledge of the nature and the position of medicines, and the ill effects of their injudicious use, and also to guard against the too free diffusion of poisons.

4th. The science of pharmacy being specially entrusted to the keeping of druggists, it is the duty of each member of the profession to impart the fruits of his observation and experience to his fellow laborers in the same vocation. It is by the fulfilment of this duty that pharmacy has grown from an obscure and empirical art to its present improved position among the practical sciences, and may be greatly advanced toward a higher and more perfect art.

5th. Connected with the foregoing is the duty we owe to those who are hereafter to assume the duties and responsibilities of the profession. To discountenance a superficial, scientific and practical education, and to impart to those placed under our care the requisite knowledge and skill; to imbue them with a high appreciation of the importance and responsibility of their calling, and of its connection with the physical sciences, and to suppress every tendency to professional quackery, are duties which the present

generation owe to the future, and on the fulfilment of which the future progress of our art depends.

The common bond of union which these duties to the public and each other and the community of interests growing out of them, seem to furnish, has until recently produced no such general union of purpose and action among the druggists of the United States as might have been anticipated.

Indeed, to a great extent, these duties and obligations so abundantly acknowledged abroad, and many of them made the subject of legal enactments in Europe, have been but too little recognized here. The people occupied with developing the natural resources of a new and uncultivated country have given little attention to those arts and accomplishments which are inseparable from a high state of civilization and refinement, and our druggists, like most other business men, have looked almost exclusively at the pecuniary relations of the trade, and with a few exceptions in the large cities have had no special concern about its scientific and ethical relations.

It is only recently that we are beginning to find out the great law that regulates our progress. That while in regard to the apparent *necessities* of life the supply always follows the demand; in regard to its *refinements* and *elegancies*, the reverse is the case; the demand grows up under the stimulus of increasing supply. A retrospect of the last thirty years is full of instruction in this particular. Not long since there were scarcely half a dozen sets of apothecaries' weights in Philadelphia. There were so few shops that could be depended on, that prominent physicians preferred dispensing their own remedies. Even the best druggists could scarcely make a respectable show of bottles upon their shelves from the paucity of the *Materia Medica* then in use, and the chief reason that made the business lucrative, was its association with other branches of trade, and the absence of any great competition.

The establishment of Colleges of Pharmacy in Philadelphia, New York, and Baltimore, was the first cause of favorable change. The members of these institutions by association learned to sink petty jealousies in a united effort for the common good; they set about self improvement, and commenced to teach their apprentices how to become better chemists and pharmacutists than themselves. They called forth a spirit of activity in the field of

experiment and observation, and as a result a home pharmaceutical literature sprung up, a National Pharmacopœia was adopted, the U. S. Dispensatory, and Ellis' Formulary were issued from the College of Pharmacy faculty, a general improvement begun to manifest itself in every department of the business, and brought a corresponding increase of public patronage; thus a higher appreciation of the pharmaceutic art, and a more liberal spirit toward its votaries growing out of efforts originating with the druggists themselves, has taught the descendants of these worthy pioneers that the further elevation and improvement of their profession rests on their own shoulders; and that in union there is strength.

(To be continued.)

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#### PHARMACEUTICAL GLEANINGS.

*New Pill Machine.*—The following description of Lewis's Patent Pill Machine is taken from the Pharmaceutical Journal for December, 1853. It is an improvement on that of Pond and Morse, figured in our last volume, and overcomes the chief difficulty in the use of the latter apparatus, that of discharging the pills from the hemispherical moulds after they are formed.

"The machine consists of two metal cylinders or rollers, having on their surface a series of hemispherical indentations or cups, corresponding in shape and size to half a pill, so that when the rollers are brought into contact side by side, and a rotary motion given them, the hemispheres in each fall opposite each other, forming a series of spherical moulds, in which, in working, the pills are cast. The arrangement for working the rollers consists of two uprights, in and between which they are fixed side by side so as to revolve on their axles. Motion is communicated by means of a handle attached to a small pinion, fitting a cog-wheel at the side of one of the rollers, at the other side of which is another cog-wheel fitting a corresponding one on the other roller; these being accurately adjusted cause each other to revolve with equal speed so as always to bring the hemispheres opposite each other. The pill mass is introduced (by means of a small hopper, between the two rollers while in motion, and as from their being in close contact it cannot pass through, it is pressed into the hemispheres, and the pills are thus formed, which are collected from

the outer sides of the rollers as they continue to revolve. Thus far the simple plan of making or casting pills by means of a rotatory machine, with minor modifications, has been before attempted, but as frequently abandoned from the pills remaining firmly imbedded in the hemispheres of one or other of the rollers, and the want of contrivance to deliver them freely, without the necessity for detaching them with the hand. That difficulty, in the present machine, is entirely overcome, and this achievement is its principal claim to originality and practical utility. The arrangement by which this long sought desideratum is accomplished consists of a moveable bolt or pin at the bottom of each hemisphere, which, acted upon by springs at the interior of the rollers, forces out the pills, and detaches them effectually from the mould in which they have been cast. The only point of adhesion is now the end of the pin, from which they generally fall by their own gravity; but to prevent the possibility of their being drawn back again into the hemispheres by the return of the pins to their original position, they are gently lifted off by being carried between the teeth of a sort of rake pressing against the outside of the rollers. Some of the pills thus formed have a slight rim round them, giving them the appearance of a seed or berry, but in every other respect they are perfect; they may therefore be left in their original state, or subjected to the usual process of mulling. From this machine, which had only two bands or tiers of hemispheres round the rollers, about 150 pills might be turned out in a minute, or 9000 in an hour, working it very slowly. There would be no difficulty in doubling the speed of working, and the rapidity of making might be multiplied by increasing the number of moulds or hemispheres on the rollers."

*Test for Turpentine in Naphtha and Oil of Amber.*—Dr. Bolley suggests the following means of ascertaining the presence of this adulteration, which is founded on the property possessed by oil of turpentine to form a crystalline compound (artificial camphor) with dry hydrochloric acid gas. The suspected oil is put in a tall cylindrical glass vessel, and a slow current of muriatic acid gas, previously dried by passing through a bottle filled with fragments of chloride of calcium, passed into it by a tube dipping to near the bottom. The current is to be continued about an hour, and if oil of turpentine is present to the extent of even five per cent. the mixture gives crystalline evidence of it after standing 12 hours.



Of course, where the proportion is greater the artificial camphor is apparent much sooner.

M. Saladin says that oil of turpentine to the fraction of 1-30th can be detected in naphtha by rubbing a few grains of iodide of potassium and water with the suspected naphtha, when if turpentine is present, the water acquires a yellow or even orange red color.

*Rancid Butter.*—Wild (Pharm. Jour.,) states that if rancid butter be kneaded thoroughly with fresh milk and afterwards with pure water, it is rendered as pure and fresh as when recently made. The effect is ascribed to the removal of free butyric acid, which is soluble in milk, and upon which the rancidity depends.

*Siberian Rhubarb.*—Mr. Bell states in his Journal, Jan. 1854, that twelve chests of rhubarb, imported from St. Petersburg, were recently sold in London, which is certified to be part of a crop of rhubarb grown in Siberia in 1793, from seed obtained in the rhubarb country of China, by order of the Empress Catharine II., of Russia. Mr. Bell describes it as in small pieces, the largest from  $2\frac{1}{2}$  to  $3\frac{1}{2}$  inches long, 1 to  $1\frac{1}{2}$  diameter, and cylindrical or semi-cylindrical in shape. Some of the chests were in much smaller pieces. The bark is pared off. Its color is remarkably good, and the odor not peculiar. It is supposed to be the product of *Rheum undulatum*, which Guibourt says was formerly cultivated in Siberia.

*Should colchicum seed be bruised for pharmaceutical treatment?*—Mr. H. Bonnewyn (Annals of Pharm. Jan. 1854.,) to settle this mooted question made the following experiments. He prepared two tinctures, one with five ounces of the whole seeds with ten ounces of alcohol, and the other with five ounces of the same seeds in powder with the same quantity of alcohol; both were macerated a month with frequent agitation, and filtered. To decide their relative value he extracted the colchicia from each of them by Liebig's method, and found that the quantity of colchicia was considerably greater in the tincture of the bruised seeds than in the other. He then had them tried by a physician, who pronounced the tincture of the bruised seed decidedly superior to the other. The alcohol used contained 67 per cent.

*Vegetable Musk as a substitute for True Musk.*—The high price of true musk, and its constant adulteration, induced Dr. Hannon (Jour. de Pharm., Jan. 1854,) to seek for a vegetable substitute. Having tried the *Adoxa muscatellina*, and *Malva moschata*, with

some success, he next examined the *Mimulus moschatus*, a Columbian plant, cultivated in Belgium, which yields an essential oil by distillation, which Dr. Hannon calls *vegetable musk*. Regarding the physiological effects of this vegetable musk, Mr. Hannon says: "Taken in doses of two or three drops, this essential oil exerts an energetic excitant action on the intestinal canal, and on the brain. In a state of health it caused vertigo, cephalagia, dryness in the pharynx and in the œsophagus, heaviness over the epigastrium and eructations. M. Hannon considers it applicable in hysteria and analogous complaints depending directly on the nervous system. He believes it may replace the animal product and may be given in doses of two to four drops in twenty four hours.

*On the preparation of Oil of Morphia.*—M. St. Lager says the oil of morphia is habitually prepared by adding a concentrated solution of acetate of morphia to olive or almond oil, and mixing by agitation. The morphia solution separates on standing, and when the mixture is applied to the skin the oil prevents the watery solution from being absorbed and consequently from exerting its activity. M. St. Lager proposes to employ pure morphia in lieu of the acetic salt. He dissolves the morphia in a little chloroform, adds the solution to the oil, and thus obtains a "complete solution of a perfectly homogeneous composition."

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## RESEARCHES ON THE ETHERS.

BY M. BERTHELOT.

### I. *Formation of the Compound Ethers by means of Ethers and Acids.*

Can ether, formed at the expense of alcohol by elimination of water, reproduce the alcohol whence it has arisen, or at least the combinations of which this alcohol forms an integral part? This question has been proposed more than once; and in spite of certain facts repeatedly announced, it is not, I think, regarded as settled. Nevertheless it is not perhaps without some importance. In fact, in a theory widely received, the compound ethers are represented by an anhydrous acid combined with oxide of ethyle, a substance isomeric or identical with ether. The direct production of the compound ethers by means of ether and the acids has a tendency to support this view, although it is also susceptible of other explanations.

This production is effected by heating the acid and ether, enclosed in very strong tubes, to about  $680^{\circ}$ - $752^{\circ}$  F.

The author has procured benzoic ether in this manner from ether and benzoic acid. It possessed the odor and specific properties of benzoic ether, boiled at  $416^{\circ}$  F., and gave on analysis—

			Formula.
Carbon	. . . .	72.2	72.0
Hydrogen	. . . .	6.7	6.7

Treated with potash and water, it reproduces the benzoic acid; and in place of the ether, a volatile inflammable liquid, soluble in water, which, when touched with a drop of a mixture of sulphuric and butyric acids, evolves the odor of butyric ether. These characters belong to alcohol.

The ether employed in the preceding experiment had been shaken five times with its volume of water, so as gradually to dissolve the half; it was then dried upon chloride of calcium, and rectified. After nine hours' contact with the benzoic acid at  $680^{\circ}$  F., it furnished 30 per cent. of benzoic ether (16 grms. produced 5 grms.). The formation of the benzoic ether commenced at  $572^{\circ}$  F.; but at this temperature, even after long contact, there was but little of it.

With the view of acquiring greater certainty with regard to the purity of the ether employed, the author rectified the ether purified by the above method, distilling only the half of it at a fixed temperature; the distillation was then repeated upon this portion, only collecting the half of the product. The ether thus obtained furnished 25 per cent. of benzoic ether after three hours' contact with the acid at  $680^{\circ}$  F.

Ether and butyric acid, kept for six hours at  $690^{\circ}$  F., produced butyric ether. The liquid in the tubes, submitted to distillation, only furnished ether, water, butyric ether and butyric acid. No gas was evolved.

At the same temperature, ether and palmitic acid produced palmitic ether, fusible at  $72^{\circ}$  F.

In these instances neither the acid nor the ether was entirely combined, whatever might be the excess of one or other of them.

Ether and water, heated to the limit of decomposition ( $842^{\circ}$  F.), do not combine.

## II. *Direct formation of the Ethers by means of Alcohol and Acids.*

The union of acid and alcohol to form ether is effected either directly or by the intervention of a mineral acid. The direct com-

bination is generally easy with the energetic acids; but with the organic acids, such as acetic acid, becomes very slow and incomplete. But with the aid of sulphuric acid, the combination is immediately and almost completely effected.

The author has arrived at the following results by employing close vessels, and the assistance of long exposure to heat, in the direct preparation of the ethers:—

At  $392^{\circ}$ – $482^{\circ}$  F., the combination of the alcohols with the fatty acids is effected with rapidity. In this manner the author produced at  $482^{\circ}$  F. the following ethers:—

Methylopalmitic ether, a crystalline substance, fusible at  $82^{\circ}$  F., solidifying at  $72^{\circ}$  F.;

Ethylopalmitic ether, fusible at  $70^{\circ}\cdot7$  F., solidifying at  $64^{\circ}\cdot4$  F., and reproducing, by the action of potash, palmitic acid, fusible at  $142^{\circ}$  F.; and

Amylopalmitic ether, a waxy substance, fusible at  $48^{\circ}$  F.; with potash it reproduces palmitic acid, fusible at  $142^{\circ}$  F.

The combination of the alcohols with the fatty acids is never complete, either for the alcohol or the acid. But these three ethers are most abundantly formed in the presence of an excess of acid, which is afterwards separated by lime and ether. When heated afresh to  $500^{\circ}$  F. for fourteen hours with eight or ten times their weight of palmitic acid, they are found after the operation to have undergone no change whatever.

With thirty hours contact at  $212^{\circ}$  F., benzoic, acetic, and butyric ethers were produced in great abundance, especially the latter. Stearic ether even begins to be formed in 102 hours, but in very small quantity. The addition of acetic acid to the mixture in the latter case causes the stearic acid to become completely etherified in 102 hours. This corresponds with the known action of sulphuric and muriatic acids, only differing in the comparative weakness of the acetic acid. It appears especially in this case that the combination of the stearic acid with the alcohol is induced by that which takes place between the acetic acid and the same alcohol. It is a pretty clear instance of the propagation of molecular movement.

The ready etherification of the fatty acids in an alcoholic liquid, rendered acid even by acetic acid, appears to the author often to render the purification of these bodies very delicate.

### III. *On the Decomposition of the Ethers.*

The ethers are split by the same agents which cause their formation. Thus—

Water heated to  $212^{\circ}$  F., for 102 hours, with stearic and oleic ethers, begins to split them, with regeneration of stearic and oleic acids. Under these conditions it does not act at all upon benzoic ether.

Acetic acid, diluted with 2 or 3 vols. of water, when in contact with stearic ether for 106 hours at  $212^{\circ}$  F., distinctly acidifies the stearic ether without producing acetic ether; it partially decomposes butyric and benzoic ethers, with formation of butyric and benzoic acids.

Fuming muriatic acid, in 106 hours, at  $212^{\circ}$  F., produces double decomposition with acetic, butyric, benzoic and stearic ethers. The acids are set free, and muriatic ether is formed. The decomposition is never complete, unless in the case of stearic ether.

Thus a weak acid may be etherified or its ether decomposed at will under the influence of muriatic, or even of acetic acid. This difference in the action of the same substance results from the presence of an excess of water in the one case, of alcohol in the other. The mass and relative energy of the acids are also to be taken into account.—*Chem. Gaz.*, Jan. 1854, from *Comptes Rendus*, Dec. 5, 1853, p. 855.

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#### PATENT GRANTED TO G. SHAND AND A. McLEAN, FOR IMPROVEMENTS IN OBTAINING PRODUCTS FROM TAR.

This invention has reference to the treatment of tar, for the purpose of extracting its products, and rendering the same available for useful purposes, whether the tar to be so treated be obtained from wood, coal or animal substances.

In order to accomplish these objects, the tar is submitted to the following processes:—In the first place, crude or rough naphtha and ammonia is distilled over in the usual way from coal or gas tar; and by further distillation, “pitch oil,” “tar oil,” or “creosote oil” is obtained, which the patentees denominate crude “naphthaline oil.” Secondly, this oil is purified by means of acids and alkalies, in the manner hereafter described; and from the oil so purified, the naphthaline, and also a lighter and a heavier oil, is extracted. And, lastly, tar obtained from wood or

animal substances is submitted to the same processes, to extract therefrom the crude oil, to purify it, and to separate from it the purified oils and the denser substances contained therein. In order to carry into effect the first series of processes, forming part of this invention, the patentees take coal or gas tar, and put it into a still of any suitable construction, with a worm and condensing apparatus attached thereto, and by means of steam passed into the still from a steam-boiler, the crude or rough naphtha is distilled over in the usual way until the crude naphtha coming over from the still becomes of the specific gravity of about  $910^{\circ}$  (water being considered  $1000^{\circ}$ ). The steam is then shut off, and by the application of heat from a fire, a quantity of water is distilled over, as well as the previously-mentioned naphthaline oil, which is commonly called pitch oil, tar oil or creosote oil. The distillation is still continued until the oil reaches the specific gravity of about  $990^{\circ}$ ; the fire is then withdrawn, and the residue of the pitch in the still is run off in a heated state, and allowed to cool in the usual way. A further quantity of oil may be extracted from the pitch by subjecting it to a strong fire-heat in a retort, with a worm and condensing apparatus attached thereto.

The second part of the process relates to the purification of the crude naphthaline oil, and the extraction therefrom of the naphthaline and oils which it contains. For this purpose the crude naphthaline oil is put into a leaden vessel, and to every 100 gallons thereof about 15 gallons of sulphuric acid, of the specific gravity of about 1.830, is gradually added, the mixture being continually stirred until the acid has become mixed with all the impurities with which it can combine. The contents of the vessel are then allowed to settle, and the clear liquor is drawn off into another vessel. To every 100 gallons of oil about 10 gallons of caustic alkali, having the specific gravity of about 1.350, is next gradually added; and this mixture is kept continually stirred, until any excess of acid left in the oil is neutralized, and all other impurities with which the alkali can combine are taken up. The contents of the vessel are then allowed to settle, and the clear liquor is drawn off and put into a still of any convenient construction, with a worm and condensing apparatus attached.

The process of distillation is carried on until the oil coming over reaches the specific gravity of about  $940^{\circ}$ . The oil from



the still is then run into a second vessel (leaving the former product of distillation in the manner hereinafter described); and the process of distillation is continued until the contents of the still are run off. The oil, so distilled, is next treated with a small quantity of caustic ammonia, in a dry state, for the purpose of absorbing any trace of water remaining in it. When the oil has been allowed to settle, and has undergone filtration, it is ready for use, either alone or mixed with other oils. This manufacture of oil the patentees denominate "purified heavy naphthaline oil."

The inventors then take the former product of the distillation of the crude naphthaline oil before mentioned, and put it into any convenient still, with a worm and condensing apparatus attached, and to every gallon of oil about 1 lb. weight of caustic lime, or burnt lime-shells, are added. The oil and lime, having been well stirred together, are acted on by a gentle heat from a fire; and a light volatile oil is distilled over, which is afterwards rectified by means of steam from a steam-boiler, and passed into any suitable still, with a worm and condensing apparatus attached. This manufacture of oil is useful for solvent and other purposes. The distillation is still continued until the product reaches the specific gravity of about 910°, when a stronger heat is applied from the fire, and the oil is run from the still into a second vessel, the operation being continued until the contents of the still are distilled over. The oil last distilled is then allowed to cool down to a temperature of from 30° to 40° F., when the naphthaline will be deposited at the bottom of the vessel, and may be separated from the oil by filtration and pressure. The oil from which the naphthaline has been separated, and which is called by the patentees "light naphthaline oil," is treated with magnesia or other substance, in a dry state, to absorb any trace of water, and when filtered is ready for use. Naphthaline may also be obtained by treating the purified heavy naphthaline oil with caustic lime, in the manner above described. In order to purify the naphthaline, after it has been separated from the naphthaline oil, the naphthaline is put into a retort or any convenient apparatus, and with a gentle heat it is sublimed in vapor into a wooden chamber, where it condenses in flakes of a white color.

The last part of this invention consists in applying the series of processes above described to tar obtained from wood or animal substances. For this purpose the tar thus obtained is treated in a



similar manner to that described in reference to the purification of crude naphthaline oil, and the heavier and lighter oils, and also the denser substances extracted and separated therefrom, such oils and denser substances being purified in the manner above described in reference to the heavier and lighter naphthaline oils and the naphthaline.—Sealed Nov. 5, 1852. *Chem. Gazette*,

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### SACCHARINE CARBONATE OF IRON AND MANGANESE.

By T. S. SPEER, M. D., OF CHELTENHAM.

The introduction of the metal manganese into the domain of therapeutics, due, I believe, in the first instance, to the Belgian physician M. Hannon, has within the last two years been followed by a careful investigation of its medicinal properties on the part of several French physicians.

From them, it would appear that this metal when given in combination with iron, is capable of rendering signal services in those diseases where iron alone has been hitherto prescribed, and at the present moment, the ferro-manganic preparations hold a prominent place in continental practice. As I am not, however, aware that they have yet undergone a trial in this country, or at least one, the results of which have been made public, I venture to state shortly, what a limited experience of two years enables me to say upon this subject; inasmuch as during that period I have embraced every legitimate opportunity of prescribing the combination mentioned at the head of the present communication.

In a paper published in the *Revue Medico-Chirurgicale* for June, 1849, M. Hannon first suggested the following preparations of manganese, viz., the carbonate, the tartrate, the phosphate, the neutral malate, and the iodide. With none of these was a similar salt of iron associated.

M. Petrequin, of Lyons, however, having taken up the subject of manganic preparations, published in the *Bulletin General de Therapeutique* for March the 15th and 30th, 1852, two papers containing the results of his experience relative to the utility of the metal in question when administered in conjunction with iron.

The preparations employed by him consisted chiefly of the iodide and lactate of iron and manganese in the form of syrup, and of the carbonate of the two metals in the form of pill.

Being desirous of trying the effects of such a combination in

some of the numerous cases where iron is usually indicated, I endeavored to associate the two metals in the shape of a carbonate of the protoxide, and to retain them in this condition through the medium of sugar, as is done in the case of the saccharine carbonate of iron, very recently introduced into the London Pharmacopœia—a chalybeate perhaps superior to every other, and possessing an advantage which few practitioners will not recognise in these days of tasteless globules, namely a complete freedom from that nauseous inky flavor which the preparations of iron usually impart to the palate.

The following is the formula I suggested, and according to which the preparation in question was made:—

*Saccharine Carbonate of Iron and Manganese.*

Take of Finely powdered sulphate of iron	℥iij. ʒj.
Carbonate of soda	℥v.
Sulphate of manganese	℥j. ʒj.
White sugar	℥iiss.

Dissolve each of the three first mentioned ingredients in a pint and a half of water, add the solutions, and mix them well; collect the precipitate on a cloth filter, and immediately wash it with cold water; squeeze out as much of the water as possible, and, without delay, triturate the pulp with the sugar, previously reduced to a fine powder. Dry it at a temperature of about 120° Fah.

The compound thus prepared is a powder of a reddish-brown color, and devoid of all taste, save that imparted by the sugar, with which the salts of the two metals are conjoined. The dose is five grains, gradually increased up to ʒj., three times a day; it should be given with the meals, or at least immediately after.

In the papers alluded to above, Mr. Petrequin asserts, that cases of anæmia, which had resisted the administration of iron alone yielded rapidly to a combination of this metal with manganese. In confirmation of this statement, I may say, that in two cases which lately came under my notice, the one of chlorotic anæmia, with amenorrhœa; the other of uncomplicated traumatic anæmia, both of long standing, the saccharine carbonate of iron and manganese succeeded entirely, after iron alone had failed. In each of these cases, its effects upon the composition of the blood, and through this, upon the general health, were extremely rapid, thus affording a contrast to the effects of the simple preparations of iron, which, even when eventually successful, are usually slow in their operation.—*Pharm. Journ.* from *Medical Times and Gaz.*

## ON THE MANUFACTURE OF AMMONIA AND AMMONIACAL SALTS.

(Continued from page 38.)

*Ammonia from the Ammoniacal Waters of Coal Gas-works.*—

The chief source whence ammonia is now obtained, is the ammoniacal waters produced in the distillation of coal, as performed at gas-works. A great number of processes have been devised for the purpose of obtaining ammonia and ammoniacal salts from these waters in the most convenient and economical way, the principal of which we now proceed to notice. As most of these processes have for their object the obtaining of more than one of these salts, we have found it preferable to describe them in the order of priority of invention, rather than under the head of each particular salt. Mr. Ledsom took out a patent, March 2nd, 1827, for improvements in the manufacture of muriate of ammonia. In this process, a quantity of the ammoniacal liquor obtained from the distillation of coal is converted into muriate of ammonia by saturating it with muriatic acid. When this has been done, the liquor is to be evaporated and the salt reduced to a crystalline state. The crystals are then to be dissolved in water, and lime added to the liquor in the proportion of fifty pounds of lime to 100 pounds of muriate of ammonia. The gas passed off from the retort in the process of distillation, having been conducted through water for the purpose of cooling it and separating the tar, is now to be passed through this liquor, when the sulphuretted hydrogen which it contains, uniting with the ammonia, for which it has a great affinity, becomes soluble in the water, and remains principally in the purifier. But if any portion of the sulphuretted hydrogen happens to pass over, it is arrested by another vessel of water containing the mixture above described. When the muriate of ammonia in the liquor has become spent, the liquor is to be drawn off from the purifier, and a fresh supply introduced, and the spent liquors may be restored by another quantity of muriatic acid. Messrs. Midgley and Kyan patented, November 4, 1837, the following process for obtaining ammoniacal salts, and at the same time preventing the usual nuisance arising from the vapors evolved from manufactories when the ammonia is extracted from ammoniacal liquor according to the modes of manufacturing it previ-

ously in use. For this purpose, the patentees submit the ammoniacal liquor to the action of lime, in the following manner:—To every 500 gallons of the liquor they add 250 lbs. of quicklime, slacked with a sufficient quantity of water. This is poured on to a grating, which is employed for the purpose of preventing large pieces from passing through, and is kept well agitated. It is then placed in a still, in which it is heated to from  $170^{\circ}$  to  $200^{\circ}$  Fahr. The ammonia thus becomes evolved, and is thence passed into acid by which salts are formed, which are obtained in solution. When the ammonia is worked off, the residuum is cleared out and a fresh charge put in. Mr. William Watson took out a patent, November 8, 1838, for improvements in the manufacture of liquid ammonia applicable to the purposes of dyeing, scouring, and other manufacturing processes. “In this process,” states the patentee, “which I have invented, I manufacture the liquid ammonia from gas-water, and I dispense entirely with the use of sulphuric or muriatic acid, and of course with the evaporation and crystallization. I make it in the following manner:—The gas-liquor, or gas-water, I put into a retort or any other suitable vessel, along with fresh slaked lime, the quantity of which is to be determined by the quality of the water; by the application of heat, a tolerably pure liquid ammonia is disengaged, which, being passed into water, forms a solution of ammonia. When this distillation has been carried so far that a considerable portion of steam or the vapor of water proceeds from the retort along with the ammonia, the ammoniacal solution, already formed, is to be removed—this I call the first portion; and what is collected afterwards by a continuation of the process, I call the second portion; and, being very impure, it is put back into the retort with the mixed charge of gas-water. The first portion must be again submitted to distillation, with or without a small quantity of lime, and the same precaution must be observed as before, that is, so long as the principal part of what proceeds from the retort or boilers is ammoniacal gas, it must be passed into water; and when this ceases to be the case, as by continuing the heat the water as well as the ammonia will evaporate, the solution of ammonia already formed, must be removed. This may be called the first portion of the second distillation. The process may be continued then until all or nearly all of the ammonia is distilled; this second portion is to be returned as before to

the retort. The first portion of this second distillation is a solution of ammonia, sufficiently pure for common purposes; but it may be still further purified by distilling it a third time in the same manner as before, preserving that portion only which is made by the absorption of the ammoniacal gas in water, and returning to the retort the latter products of the process, which consist of ammonia and water mixed with impurities." Mr. Croll's process (patented July 29th, 1840) for obtaining the salts of ammonia, are of two kinds: in one of these dilute sulphuric or muriatic acid is employed to abstract the ammonia from the gas, and in the other chloride and sulphate of manganese and muriate of iron are employed for the same purpose. In the latter case a vessel used in the manufacture of gas holding wet lime for the purposes of gas purifying, is filled with a solution composed of 1 cwt. of chloride of manganese to forty gallons of water, and the gas is forced through this solution in the usual way by the pressure of the retorts, by which means the ammonia is absorbed. As soon as this solution is saturated with ammonia, it is drawn off, and the vessel fresh charged. Sulphate of manganese and muriate of iron may also be employed in the same way to absorb the ammonia produced in the manufacture of coal-gas.

In the case of using sulphuric acid, a vessel more commonly employed for washing gas is filled with a solution composed of 100 gallons of water to two pounds and a half of sulphuric acid, spec. grav. 1.845, and the gas is passed through it as usual until it has attained the spec. grav. of 1.170, and is saturated with ammonia; it is then drawn off and the vessel charged anew.

When muriatic acid is used it is applied in the same manner, as regards proportion, the acid being of spec. grav. 1.165 before it is mixed with the water: the solution of muriate of ammonia is to be drawn off when it has acquired a density of 1.176. In order to obtain the ammoniacal salts (when a salt has been used for purification,) the insoluble part of the mixture is allowed to settle, and the clear liquor, which contains muriate of ammonia and sulphate of soda, is drawn off. These must be separated from each other, either by crystallizing the salts of ammonia from that of soda, or by evaporating both to dryness, and subliming the ammoniacal salt. If an acid be employed it is only necessary to evaporate the ammoniacal solution. The salts formed by the use of the

chloride of manganese and salts of zine, may be obtained by the same means.

Mr. Croll thus describes his peculiar mode of manufacturing or reproducing the salts by the double decomposition of salt and the residuum and precipitates of chloride of manganese:—To twelve ounces of the dry precipitate, add one pound of common salt, mix them intimately together, and submit them, in a suitable furnace, to a heat scarcely perceptible in the dark, for two or three hours; then to 140 pounds of this mixture add forty gallons of water. It is then fit to be used for purifying gas from ammonia, and the residuum which the gas leaves in passing through it is to be heated in like manner. The insoluble part of the solution before mentioned may be brought to its original state by dissolving it in the acid forming one of its constituents, or dissolving it in sulphuric or muriatic acid, by which means a sulphate or muriate of ammonia is obtained. In Mr. Waterton's patent, dated August 27, 1840, for the manufacture of muriate of ammonia, two methods of effecting the proposed object are there described. The first consists in making a saturated solution of common salt in water, and mixing with it a quantity of finely pulverized carbonate of ammonia, about equal in weight to the salt contained in the solution. The mixture is agitated in a close vessel for six or eight hours, and as much carbonic acid gas is passed therein as it will absorb (but the introduction of this gas is not absolutely necessary, although the patentee prefers it,) the liquid is then separated from the solid matter by filtration and pressure. The solid matter is chiefly bicarbonate of soda, and the liquid holds in solution muriate and carbonate of ammonia and common salt, and sometimes a small portion of the bicarbonate of soda.

The liquid is now placed in a distilling vessel, and the carbonate of ammonia being distilled over into a suitable receiver, a solution of muriate of ammonia and common salt remains in the still. This solution is evaporated by heat to such a consistency as will cause the separation of the common salt by crystallization, and the salt thus crystallized is separated from the liquid by any convenient method. The liquid is then evaporated until it attains the proper specific gravity for crystallizing, and it is transferred into suitable vessels for that purpose. The crystals produced by these means are nearly pure muriate of ammonia, and when pressed and

dried, may be brought into the market without further purification or they may be sublimed into sal ammoniac.

The other mode of manufacturing sal ammoniac consists in taking a quantity of liquid containing ammonia, either in the caustic state or combined with carbonic, hydrosulphuric, and hydrocyanic acids (as in the case of the ammoniacal liquor of the gas works) and rectifying it by distillation until the distilled portion contains from twenty to twenty-five per cent. of carbonate of ammonia. If the liquid contain any other acids than those above mentioned, a sufficient quantity of lime is used in the distillation to decompose the ammoniacal salt. The distilled liquid being now mixed with as large a quantity of powdered common salt as it will dissolve, is agitated for several hours, and as much carbonic acid gas is passed into it as it will absorb. The remainder of the operation is the same as before described in the method of manufacturing muriate of ammonia.

In 1841 Mr. Laming took out a patent for manufacturing carbonate of ammonia by mixing together its separate acid and alkaline constituents instead of by the decomposition of an ammoniacal salt. One of the processes used, is to cause ammonia and carbonic acid gas, obtained separately from any convenient sources, to traverse a succession of leaden chambers, maintained at as cool a temperature as may be conveniently practicable, and so contrived as to favor the admixture of the dissimilar gases. In this process it is not essential that the two gases be present in their combining proportions; it is preferable that the carbonic acid be in greater abundance than will combine with the ammonia which is present. Sometimes a stratum of water, or of water impregnated with ammonia, is placed in one or more of the leaden chambers, and carbonic acid and ammonia in the form of gas are then introduced; in which case, it is stated, a larger proportion of carbonic acid gas is found in the resulting salt or saline solution than when only the hygrometric moisture of the aeriform fluids is present. In Mr. Astley's process of manufacturing muriate of ammonia, the bittern or muriate of magnesia, obtained from the sea-salt works, was employed as the source of muriatic acid, and the parings of skins, horns, and other animal matters, furnished the ammonia. The animal matters were saturated with the bittern in stone-rooms heated by brick flues, and being afterwards subjected to a red heat in a close kiln, muriate of ammonia was obtained.



A valuable improvement in the mode of obtaining ammonia from ammoniacal solutions was patented in the name of Mr. W. E. Newton, patent agent, November 9, 1841. The real patentee, we believe, was Mr. Laming, of Clichy Chemical Works, near Paris. This improvement consisted in the application of the well-known still, invented by Mr. Coffey for the distillation of spirit, to the production of ammonia, either pure or more or less impure, according to the purpose for which it is required from any liquid, from which, by the agency of steam, it may be eliminated, either alone or in conjunction with vapor, carbonic acid, or other volatile matters, the presence of which do not prevent the application of ammonia to one or more useful purposes.

This apparatus or ammonia still is an upright vessel, divided by horizontal diaphragms or partitions into a number of chambers. It is proposed to construct the vessel of wood, lined with lead, and the diaphragms of sheet iron. Each diaphragm is perforated with many small holes, so regulated, both with regard to number and size, as to afford, under some pressure, passage for the elastic vapors which ascend, during the use of the apparatus, to make their exit by a pipe opening from the upper chamber. Fitted to each diaphragm are several small valves, so weighted as to rise whenever elastic vapors accumulate under them in such quantity as to exert more than a certain amount of pressure on the diaphragm. A pipe is also attached to each diaphragm, passing from about an inch above its upper surface to near the bottom of a cup or small reservoir, fixed to the upper surface of the diaphragms next underneath. This pipe is sufficiently large to transmit freely downwards the whole of the liquid which enters for distillation at the upper part of the upright vessel, and the cup or reservoir, into which the pipe dips, forms, when full of liquid, a trap, by which the upward passage of elastic vapors, by the pipe, is prevented. The vessel may rest on a close cistern, contrived to receive the descending liquid as it leaves the lowest chamber, and from this cistern it may be run off, by a valve or cock, whenever expedient. The cistern, or in its absence the lowest chamber, contains the orifice of a pipe, which supplies steam for working the apparatus. The exact number of chambers into which the upright vessel is divided is not of essential importance; but the quantity of liquid and the surface of each diaphragm being given, the distillation within certain limits will be more complete, the greater the number of

chambers used in the process. The liquid, undergoing distillation in this apparatus, necessarily covers the upper surface of each diaphragm to the depth of about an inch, being prevented from passing downward through the small perforations by the upward pressure of the rising steam and other elastic vapors; and on the other hand, the steam being prevented, by the traps, from passing upwards, by the pipes, is forced to ascend by the perforations in the diaphragms; so that the liquid, lying on them, becomes heated, and in consequence gives off its volatile matters. When the ammoniacal liquid accumulates on one of the diaphragms, to the depth of an inch, it flows over one of the short pipes into the trap below, from whence it overflows into the next diaphragm, and so on.

The management of the apparatus varies in some measure with the form in which it is desirable to obtain the ammonia. When the ammonia is required to leave the upper chamber, in the form of gas, either pure or impure, it is necessary that the steam which ascends, and the current of ammoniacal liquid which descends, be in such relative proportions that the latter remain at or near the atmospheric temperature, during its passage through some of the upper chambers, becoming progressively hotter as it descends, until it reaches the boiling temperature; in which state it passes through the lower chambers, either to make its escape, or to enter a cistern provided to receive it, and in which it may for some time be maintained at a boiling heat. On the contrary, if the ammonia, either pure or impure, be required to leave the upper chamber, in combination with the vapor of water, the supply of steam entering below must bear such proportion to that of the ammoniacal liquid supplied above, that the latter may be at a boiling temperature in the upper part of the apparatus.

Solutions of ammoniacal salts, which have had their respective acids abstracted by any of the usual means, afford, by being thus treated, ammoniacal gas, either alone or in combination with water, of considerable purity; but the apparatus is equally serviceable in obtaining similar results, more or less impure, from the ammoniacal waters obtained by the distillation of coals, or of bones, or other animal matters, as well as from stale urine. Acids and certain other matters, contained in these impure liquids, may first be partly removed by lime and other well-known means; and some of them will be further removed during the passage of the ammo-

nia through the apparatus, care being taken to use them so dilute, that the vapor, which escapes with them, shall be sufficient in quantity to prevent the solidification of the ammonia, by the carbonic acid which rises with it, and the consequent obstruction of the passages. Instead of being furnished with perforations, valves, and pipes, the diaphragms may have plain surfaces, and each be bent upwards at one of its sides, so as not entirely to separate the contiguous chambers. The diaphragms should be bent upwards at opposite sides alternately, thereby permitting the descending fluid to fall as a cascade from the right hand side of one diaphragm on to the next below; and then from the left hand side of that one on to the next in succession, and so on until the whole of the diaphragms are occupied with liquid. In this case the liquid will be heated by the contact of the ascending steam sweeping over its extensive surface; and also by the steam acting on the under sides of the diaphragms on which the liquid rests.

Mr. Philippi's process for obtaining ammoniacal salts, as patented by him, July 21, 1842, is that of decomposing the ammoniacal water of the gas-works by means of sulphate or chloride of manganese, the gas being passed through the solutions contained in suitable cisterns or apparatus. Mr. Philippi also describes an arrangement of apparatus suitable for obtaining ammonia and ammoniacal salts from gas liquor. For this purpose the gas liquor is acted upon by lime in a common distilling apparatus, heated either by steam or otherwise, by means of a worm or injection; the ammonia set at liberty by the heat escapes into a second boiler similar to the first one through a connecting pipe—the condensing of the ammoniacal vapors heats the second boiler, in which there are lime and ammoniacal waters. A third boiler is employed with the same effect, after which there is a leaden worm, in which the vapors circulate. This worm is surrounded by cold ammoniacal water, and descends into a leaden vessel, in which is deposited a solution of alkali, which at first is very strong, but becomes weaker as the distillation goes on. The alkali is withdrawn before it descends below  $220^{\circ}$ , but as a part of the ammonia is in a gaseous state, there are two other vessels prepared after the first one, the whole forming a Woulfe's apparatus. The solution of lime of the second vessel, which is not saturated after one distillation, is put into the second boiler, that the lime and ammonia which are dis-

solved in the liquid may be used. If muriate, sulphate or carbonate of ammonia be required, the vapors may be condensed in suitable vessels containing muriatic, sulphuric, or carbonic acids.

For the purpose of obtaining ammonia sufficiently pure for many purposes in the arts from gas water, Mr. Laming patented, July 14, 1843, the substitution of a solution of muriate of lime for the mineral acids usually employed. This process is as follows: he first mixes with gas water a sufficient quantity of muriate of lime in solution to convert the carbonate of ammonia, which is present, into muriate of ammonia, and, after having separated the carbonate of lime which forms, the remaining solution is exposed for an hour to a boiling temperature. This solution, after having been cooled, is first agitated with enough hydrated oxide of iron to combine with all its sulphuretted hydrogen; secondly, with lime enough to saturate the muriatic acid which is present; and, finally, it is distilled. The ammonia will be found in the water which comes over, in a tolerably pure state.

In Watson's patent of January 16, 1844, the following description of apparatus for manufacturing sulphate of ammonia is given. An iron boiler capable of holding a charge of about 260 gallons of ammoniacal gas liquor is provided, furnished with a bent pipe or tube connecting the boiler with a leaden vessel open at the top. Into the boiler a quantity of slaked lime may be placed with the ammoniacal liquor, which has the effect of hastening the operation, and producing a salt of a purer quality. The leaden vessel is partly filled with sulphuric acid (if sulphate of ammonia be required) in the proportion of about one pound weight of sulphuric acid, sp. gr. 1.700 to every gallon of water. The acid must be diluted with from three to four times its weight of water. When heat is applied to the boiler, the ammonia is driven off, and in coming into contact with the acid in the leaden vessel combines with it with the formation of solution of sulphate of ammonia, which is afterwards drawn off and crystallized. By the use of muriatic acid on muriate of lime, a solution of muriate of ammonia may be obtained.

Johnson's process (patented 1845) for obtaining sulphate of ammonia is to put the ammoniacal liquor of the gas works into a boiler similar to a steam-engine boiler, having a pipe passing from the top of the vessel containing a solution of alkali, lime, or

of sulphate of iron or manganese, into which the pipe dips; another pipe passes from the top of this vessel to the bottom of a second, containing dilute sulphuric acid. The liquor being put into the boiler, heat is supplied, and the hydrosulphate of ammonia, being the most volatile of the salts contained in the liquor, passes over; first its hydrosulphuric acid is absorbed by the contents of the first vessel, and the ammonia by the acid contained in the second vessel with the formation of sulphate of ammonia. After the hydrosulphate of ammonia has all passed over, the liquor remaining in the boiler may be drawn off and neutralized in the usual way with sulphuric acid. Or, muriatic acid may be substituted for sulphuric acid and thus muriate of ammonia may be obtained.

Mr. Johnson patented, December 20, 1845, a method of obtaining ammoniacal salts, by passing coal-gas in its way from the retorts to the gasometer, through vessels containing certain metallic salts, such as sulphate of iron as the cheapest, previously pounded very fine, and moistened with just enough water to bring the pulverized salt to a pasty consistency. Sulphate of ammonia is thus obtained.

Mr. Hills patented August 11, 1846, the following processes relative to the manufacture of ammoniacal salts. To obtain muriate of ammonia he employs muriate of magnesia, which he either mixes in the state of powder with the coal in the manufacture of gas, or he puts it in a small iron vessel placed within the same retort, or when several retorts are used at the same time, one retort may be used to contain the muriate of magnesia alone; in either case the muriatic acid liberated from the decomposition of the muriate of magnesia by means of heat combines with the ammonia to form muriate of ammonia which is collected in the ammoniacal liquor.

In the same patent Mr. Hills describes his improved apparatus for obtaining ammonia from ammoniacal liquors. This apparatus is similar in construction to a condenser which is in common use for distillation of alcohol, and which in form is a four-sided vessel, furnished with shallow pans fixed to the alternate sides. The ammoniacal liquor flows through pipes placed under the upper shelves or pans, thus keeping them cool whilst itself receives an accession of heat, and then flows into the top pan of the lower series. When this top pan is full, the liquor flows over into the next of the series,

and so on to the bottom. The pans in the lower series are kept hot by pipes, which pass under them in a zig-zag form, through which pipes hot water, steam, or hot air circulates. The liquor, in passing through this apparatus, has its ammonia sublimed into the upper part, the water running out by a pipe at the bottom.—*London Pharm. Journal*, Aug. 1853.

(To be continued.)

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#### ON THE PRODUCTION OF SCAMMONY IN THE NEIGHBORHOOD OF SMYRNA.

BY SIDNEY H. MALTASS, ESQ.

The scammony plant, called by the Greek *Σκαμμωνία*, and by the Turks *Mamoutiâ* (by which last name it is also designated by the Greeks of Anatolia), grows wild not only in all parts of Anatolia, but also in Syria and in some of the Greek and Turkish islands of the Archipelago. It affects mountainous districts, but is also found in the plains and in open ground, flourishing most luxuriantly among the Juniper, Arbutus, and wild Valonea bushes, which afford both shelter and support for its branches, and whose decayed leaves form a light soil favorable to its growth. The root is succulent, and shaped like a carrot: when about four years old, it is generally one or two inches in diameter at the crown, whence it tapers gradually to the extremity, with occasional fibres, its length varying from ten inches to two or even three feet, according to the depth of soil. Sometimes it attains a larger size, and in a few instances has been found of four or even five inches diameter at the crown. The color of the flower is usually of a pale yellow, or white with red external stripes. The root is the same, whatever the color of the flower may be, and there is no perceptible difference in the leaf. There is no distinguishing peculiarity in the scammony produced from plants bearing different colored flowers, the roots of which are cut by the peasants indiscriminately, although the yellow flowered plant is the more abundant. The only perceptible difference in quality is occasioned by the soil. The scammony which has the strongest odor is that produced in mountainous districts and on a poor soil; rich soils and marshy ground produce a scammony-juice containing a larger pro-

portion of water, which, when dry, forms a scammony of a greyish-black, and of less specific gravity.

The districts in which scammony is collected are widely extended. The peasants of Smyrna and of the neighboring villages extend their peregrinations to Adalia on the South, and Brussa, or Mount Olympus, on the North, and some have been as far as Angora. Sochia or the district of the river Mœander produces a large quantity, but Kirkagatch and Demirgik, in the plain of Mysia, furnish the largest quantity of all. But little comes from Konieh or Kutaya. The only inferior *pure* scammony that I know is produced at Melissa or Melas.

I am not aware of any scammony being produced at Samos, nor do the peasants of that island know of any plants existing there, though it is probable that a few may be found. Some of the Samians collect the drug, but they cross over to the mainland and work in the neighborhood of Sochia, on the Mœander, Scala Nuova, and Ephesus. They usually carry it for sale to Smyrna, but necessarily sell it in Samos. That which Tournefort saw must have been highly adulterated with flour or starch.\*

During the summer months the scammony is collected by the Greek and Turkish peasants while the plant is in flower. They commence operations by clearing away the bushes which shelter the plants; the soil is removed from the root to the depth of three or four inches, the root is then cut through in a slanting direction with a sickle-shaped knife, about one inch to one inch and a half below the crown; a muscle shell is immediately stuck into the root under the lower part, and the sap or 'milk' runs into it. A stone is then placed to windward of the root to protect the shell from the loose earth and dust, which might otherwise be

\* *Note by Mr. Daniel Hanbury.*—This is in reply to an enquiry addressed to the author, respecting the scammony of Samos. It appears to me, however, that very undue stress has been laid upon the brief remark of Tournefort regarding this supposed variety of Scammony. Tournefort says, "*nous ne vîmes pas la plante d'où elle se tire.*" (*Relation d'un Voyage du Levant*, Paris, 1717, tome i., p. 411.)

Further, it seems certain from information communicated to me by Mr. Maltass, that scammony is collected solely from *Convolvulus Scammonia*, Linn., in fact, precisely as Sherard stated to be the case, see *Tractatus de Materiâ Medicâ*, Paris, 1741, tome ii., p. 667.—*D. H.*



blown into it by the high winds prevalent in summer. The sap flows freely early in the morning and late in the evening, but ceases during the hottest part of the day. One plant will not generally fill a shell, but it does sometimes happen that a good root will fill two or three; in such latter case the peasant removes the first as soon as it is full and places another, and so on until he perceives that the root is nearly drained. The quantity afforded by one root varies according to soil, position, and age. In some districts one hundred roots produce but ten grains of scammony, in others the average of each root is one dram, and in a good soil a four-year plant will produce two drams. I have heard of one root, four inches in diameter, producing twelve drams of scammony, but those which I have cut did not produce over one dram, and some afforded none at all. The shells are usually left till the evening, when they are collected and the cut part of the root is scraped with a knife to remove the dry or partially dry drops of scammony which form after the first part has run off. These drops are called by the peasants *Kaimak* or cream, while the sap which flows into the shell is termed the γάλα or milk. The peasants then empty the shells (from which they carefully blow the dust) into copper vessels, and work up the drops scraped from the roots together with the contents of the shells. This is done with a knife, and continued until the whole is so well mixed that it forms a string when run off the knife. If it be too dry then water is added, but in that case it must be done during the hottest part of the day, when Fahrenheit's thermometer stands at from 86° to 90° in the shade, otherwise it will not amalgamate properly. This is the pure *Lachryma Scammony*. That which the Greeks collect is far better than that collected by the Turks; the latter, with their usual apathy, do not trouble themselves to screen the shells from the dust, nor do they blow off any of that which may have accumulated upon the hardened surface of the scammony in the shell. They show equal carelessness by scraping the roots too hard to remove the drops, and frequently allow small pieces of the root to fall into the receiving vessels.

Scammony is never sold in shells. When dry it would be difficult to empty them: the peasants, however, frequently keep a few for their own use, as this drug is much employed by them for the purpose of staunching blood and healing wounds. They also use

it as a purgative, the usual dose being one dram in a glass of warm water.\*

The scammony brought to market by the Greek peasants is almost the only pure sort that can be obtained. It does not exceed 300 *okes* yearly, or about seven hundred weight, and is sold at a high price to a few dealers who know its superiority.

When purchased it is placed in a room having the windows open to allow the wind to blow over it, care being taken to prevent the rays of the sun from striking upon it. Here it is spread upon sheepskins, flattened if moist, and turned occasionally to prevent it becoming mouldy underneath. When nearly dry it is broken up into irregular pieces and allowed to remain a few days longer until quite dry; it is then shipped in small cases containing about thirty pounds each.

Pure scammony is easily recognized when dry; it is light in weight and breaks easily with a glossy fracture. If no water have been added by the peasants, the color of the fracture is reddish-black. If water have been added, or the scammony have been collected in shady places, the fracture is black and very glossy.† If it have been put in tins or skins, the fracture is black and not so glossy. And if the dry drops or *kaimak* scraped from the roots be not worked up with the *γала* or milk, pieces will be found of a light red color resembling rosin. An emulsion is immediately produced by application of the tongue, excepting when water has been added without the assistance of the sun's rays, in which case the emulsive property becomes impaired.

\* One dram of scammony will doubtless appear a large dose, but it is nevertheless a fact that the *contents of a shell*, the average of which is a dram, is the usual quantity given.

One of the Greek peasants, while collecting scammony last year near Macri, opposite the island of Rhodes, had an application made him by a Turk, for a dose of scammony. He gave him a shell full. The Turk, thinking that if the contents of *one* shell would prove salutary, that of a *great number* would be productive of proportionately greater good, stole three or four more from the Greek, took the whole and died the same day from the effects.

† In another communication the author remarks, that the addition of water or a decoction of the scammony-plant, causes a change in the color of the drug; when dry, it becomes of a glossy black, whereas, *in the natural state, it is of the color of rosin and semi-transparent.*—ED. PH. J.

One of the best characters of genuine scammony is its golden reddish color when reduced to small fragments. *Black* scammony is indeed to be met with, but it is uncommon (unless it be adulterated), nor do I consider it perfectly pure.

The scammony which is next best to that collected by the Greek peasants of Smyrna is that collected by the Turkish peasants. It is black in color, heavier, and does not break so readily; this is occasioned by pieces of the root being scraped off whilst removing the hard drops which adhere to it. The Turks prefer sedentary work to any which requires activity, and as they know that a portion of scammony is left in the roots that they have already cut, they content themselves with pulling up these, rather than perambulate the country in search of fresh. These roots, they pound with stones and then boil them;\* after removing from the decoction the larger pieces, the remainder of it is thrown upon the scammony and worked up with it. This occasions the quantity of fibre or vegetable substance which is found in some samples of scammony.

Most of the peasants adulterate the scammony before bringing it to market. One process is as follows: after the scammony is mixed with water, a certain quantity of white chalky earth is added. The earth is first sifted through a silk handkerchief, so as to make it fine enough to prevent detection by the touch, while the scammony is in a liquid state; the peasant adds earth according to his fancy, from 10 to 150 per cent. The color of soft, moist scammony is not affected by the addition of earth, unless the quantity exceeds 20 per cent; when dry, it is apparent to any one acquainted with the drug.

The Turkish peasants sell their scammony in the different towns in the interior of Anatolia. Being poor, they cannot afford copper vessels such as are used by the Greeks; they consequently use pumpkins hollowed out, skins and earthen pots. The Jews and Greeks are the principal buyers of this scammony, but as they are not well acquainted with the drug, they do not separate the good from the bad, but throw it in promiscuously, while still fresh, into cotton bags. The bags are then put into drums and sent into Smyrna for sale. There this scammony frequently remains for some time and becomes partially mouldy; when purchased, it is turned out, but being half dry it cannot be made into flat cakes like the pure

\* Sometimes a decoction of the leaves and stalks is also used.

Greek scammony it is therefore broken into irregular pieces or rough lumps, and allowed to dry in that state. Its long confinement causes it to ferment, and this makes it porous and lose its gloss. It is this kind which is usually sold in London as *Lachryma Scammony*, and although excellent pieces may be picked out of it, the bulk is greatly inferior to that collected by the Greeks. The best lots of this sort may contain seventy-six per cent. of resin.

There is also a considerable quantity of scammony sold in London in rough lumps, which is very inferior, and yet is sometimes lighter in weight than the pure sort. This scammony is prepared by the dealers in the interior of the country. When starch has been added, it continues light in weight but becomes tenacious. The usual mixture is wheat-starch,\* wood ashes, earth (not always calcareous), and gum arabic, or gum tragacanth—occasionally wax, yolk of egg, pounded scammony roots and leaves, flour, or resin are added. These mixtures vary so much that it is almost impossible to find two parcels exactly alike. This adulterated scammony is put into drums, and scammony nearly pure and about as liquid as honey is put on the top to give it a good appearance and to prevent detection, which, without this precaution, would not be difficult, the surface of the adulterated drug being always dry.

There is also a quality of scammony prepared at Angora and sent to Constantinople for sale. It is composed of from thirty to forty per cent. of scammony with sixty to seventy of starch, and is called *Skilip*.† This quality is much used in Austria, where cheap drugs are required without much reference to efficacy.

There are also two kinds of scammony used largely in England and Scotland. The better kind termed *First quality prepared*, is made up into thick smooth cakes or loaves, and shipped in cases or drums. When packed the cakes are sometimes broken up. This

\* The scammony collected near Smyrna is rarely adulterated with starch by the peasants.

† *Skilip* or *Iskilip* is a Turkish word, and used to designate a fictitious substance. For instance, a species of yellow berry which is small and contains little or no dye, is termed *skilip*. Spurious gum tragacanth and inferior Angora scammony are known under the same name, but I am not aware of any other drug or produce of any kind to which this term is applied. The origin of the word, however, is derived from a Turkish town near Angora called Iskilip.

kind is prepared principally by the Jews and in Smyrna only ; the following is the process :—A quantity of scammony of inferior kind containing earth, woody substances and occasionally gum, as brought from the interior, is mixed with about forty per cent. of *skilip* or inferior Angora scammony, such as has been already described. This having been affected by pounding, warm water is added and the mixture placed in a shallow iron dish beneath which another of the same shape, but of larger proportions, and half filled with water, is set over a charcoal fire to act as a water-bath. When the scammony is thoroughly melted and one kind has amalgamated with the other, which usually requires about half an hour, the contents of the dish are removed on to a sheepskin and rolled with the hands till cold. It is then made into flat or oval cakes or loaves with rounded tops, which are next washed over with a solution of pure scammony to give them a gloss, and, lastly, placed in a room with open windows to dry. This scammony usually contains about fifty per cent. of pure resin.

The other kind is called *Second quality prepared*, and is made in a similar manner. It is composed of about sixty per cent. of inferior Angora scammony or *skilip*, thirty per cent. of a better kind from the neighborhood of Smyrna, to which are added about ten per cent. of gum arabic and black-lead. This scammony contains about thirty per cent. of resin, fifty per cent. of starch and white earth, and the remainder woody substances, gum, &c. Other proportions are occasionally used.

The small quantity of scammony that can be obtained pure has induced me to resort to the use of the alcohol for extracting the resin from some of the inferior qualities of the drug. The process is not adopted in any other part of Turkey, nor by any one at Smyrna than myself. It is as follows :

A bottle half-full of impure scammony is filled up with distilled spirit of wine and allowed to remain for several days until the liquid assumes the appearance of brown sherry ; it has then taken up as much scammony as it can hold in solution. This is poured off into another vessel and fresh spirit added to the residue, on which it is allowed stand two days and then strained through a cloth. These spirituous solutions having been allowed to stand until they have deposited any impurity held in suspension, are mixed, and then decanted into cold water, when the resin of scammony is pre-

cipitated. It is washed in fresh water and then exposed to the sun or placed over a fire to evaporate. This is done to remove the spirit remaining in the scammony, otherwise it would take some months to dry.

The quantity of scammony annually sold in Smyrna amounts to about 3000 Turkish *okes*, or 7500 pounds weight. Out of this quantity seven cwt. of pure can be obtained, the remainder being of different qualities, the quantity of resin that they contain varying from 1oz. to 15ozs. in every pound. If the whole crop were brought to market *unadulterated*, it is doubtful if the quantity would exceed 3000 pounds weight.—*London Pharm. Journal*, Dec. 1853.

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#### NOTES UPON SOME SPECIMENS OF SCAMMONY.

By DANIEL HANBURY.

Having through the kindness of Sidney H. Maltass, Esq., of Smyrna, received several specimens illustrating the foregoing interesting paper on the production of Scammony, I believe that a short account of them will be not unacceptable to the readers of the *Pharmaceutical Journal*.

I will premise it by stating that Mr. Maltass has resided at Smyrna for the last eighteen years, where, as a matter of business he has had constant opportunity for becoming conversant with all that relates to the drug as met with at that place: indeed, as he informs me, he has actually collected it with his own hands in order to become the more particularly acquainted with it.

To Mr. Maltass I am indebted for specimens of the following, viz:—

1. *Pure Scammony in shells*, collected near Smyrna.

It is remarkably transparent even when viewed in the shell; its color is a pale golden brown, scarcely as intense as that of common glue, of which its general appearance is suggestive. A white emulsion is produced on rubbing the surface with a wetted finger.

This scammony affords 91.1 per cent. of resin soluble in ether.\*

\* In examining the solubility of scammony in ether, it is needful to dry the scammony until it ceases to lose weight, a precaution which must of course be observed in weighing the residue also.

2. *Pure Scammony from the neighborhood Smyrna*: a portion apparently of a cake about an inch in thickness; color in the mass deep brown, in small fragments pale golden brown, translucent; although compact, readily broken, fracture glossy, showing not very numerous air-cavities; odor cheesy. A white emulsion is produced immediately it is rubbed with the moistened finger; no traces, either external or internal, of any calcareous contamination. It affords 88.2 per cent. of resin soluble in ether.

An experienced judge of scammony assures me that he has never observed any of this quality in the London market.

3. *Pure Scammony from the neighborhood of Angora* in a somewhat irregular mass, probably part of a cake about  $1\frac{1}{2}$  inches thick. It is very pale in color, small fragments appearing of a yellowish brown and translucent. It is distinguishable from No. 2 by being much cracked, a quality which imparts to it a pale color when in mass, and renders it extremely friable. The fractured surface is shining, readily affording a white emulsion when rubbed with the moistened finger.

This is a very pure scammony, containing 89.4 per cent. of resin soluble in ether. The matter insoluble in ether is nearly colorless, which is also the case with that of Nos. 1 and 2. That from No. 1 appeared under the microscope chiefly as an amorphous, gelatinous substance, soluble in water, and in which no starch-granules were observed.

4. *Pure Black Scammony* as collected in shady places. My sample appears to have formed part of a cake upwards of an inch thick. It is remarkably opaque and black even in small fragments; very thin splinters, however, show it of greyish hue. It is compact yet very brittle; its fracture glossy; it possesses the usual scammony-odor, and affords a dingy emulsion when wetted and rubbed. My experiments prove it to contain 87.9 per cent. of resin soluble in ether.

This scammony bears some resemblance externally to Solazzi extract of liquorice. It is unknown in English trade.

5. *Smyrna Scammony "adulterated,"* says Mr. Maltass, "with magnesian earth\* and vegetable matter to the extent of 20 or 30 per cent.; such is sold in London as *Lachryma Scammony*."

\* Or rather carbonate of lime.



This scammony is blackish, rather brittle and opaque, either compact or frothy; fracture not bright, readily affording an emulsion. Treated with ether, I obtained from it 79.3 per cent. of matter soluble in that menstruum.

6. *Angora Scammony adulterated* with calcareous earth and starch to the extent of 65 to 68 per cent. This scammony is heavy and greyish with a dull clayey fracture. It is evidently very impure, affording only 33.4 per cent. of matter soluble in ether.

7. *Imitation Scammony*, "prepared," says Mr. Maltass, "from the refuse of scammony gathered by the Turkish peasants after the extraction of the resin, with the addition of gum arabic and rosin."

This substance is in hard, opaque, black, irregular cinder-like masses. I have obtained from it 44.28 per cent. of resin soluble in ether. It is needless to comment on the activity of such a compound, yet I am assured that even this would fetch 10s. per pound in the London market.

8. *Pure Resin of Scammony*, extracted from Smyrna scammony of 1846. Viewed in the mass it is blackish, in small fragments transparent and greenish-brown, very brittle, outer surface and fractured surface brilliant. A very scanty emulsion is produced when the surface is moistened and rubbed.

9. *Resin of Scammony*, rather less pure than No. 8.

10. *Pure Resin of Angora Scammony*: transparent and of a golden-brown even in the mass. Like the natural Angora scammony, it is cracked in all directions and extremely friable. When moistened and rubbed no emulsion is perceptible.

In conclusion I may remark that the striking characters of pure *natural* scammony, I mean the *unmixed* inspissated juice, are its *pale, yellowish-brown hue, its transparency, its great brittleness, its property of readily affording a white emulsion when rubbed with water, and the scanty amount of a white residue which it leaves upon being treated with ether.* All these characters are well shown in samples 1, 2, and 3.

The opaque *Black Scammony* No. 4, although marked *pure*, is regarded by Mr. Maltass as questionable. It is certainly a very curious variety, which, if an entirely natural product, would form an exception to the above remarks.

*Scammony-resin* is distinguished from scammony by affording

hardly any emulsion when wetted and rubbed.—*London Pharm. Journal* Dec. 1853.

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### ON THE SO-CALLED AMORPHOUS PHOSPHORUS.

By A. PUTTFARCKEN.

The author has examined some amorphous phosphorus obtained from England. He received it in the form of a brownish-red, shining, coherent powder, the peculiar odor of which powerfully affected the eyes.

By long washing with pure water, the phosphorus lost 13 per cent. in weight. The wash-water contained phosphorous and phosphoric acids, and a small quantity of phosphate of lime. The powder, when exhausted by water, was put, when dry and neutral, into well-stopped vessels; it had however again become acid in a very short time.

15 grms. of the so-called amorphous phosphorus were oxidized with nitric acid; this was readily effected without the assistance of heat, merely by the gradual addition of the phosphorus to the nitric acid. 135 grms. of fluid phosphoric acid, of spec. grav. 1.13, were obtained. Sulphuretted hydrogen, however, threw down so much sulphuret of arsenic from the phosphoric acid, that the quantity of that metal in the phosphorus must have been equal to  $\frac{1}{2}$  per cent.

For the sake of comparison, 15 grms. of common phosphorus were converted into phosphoric acid of the same specific gravity. The quantity of acid was 160 grms.

Exposure to a temperature of  $392^{\circ}$ – $437^{\circ}$  F. for three days left the amorphous phosphorus unchanged, so that even the microscope could detect no globules of ordinary phosphorus. When heated in a glass tube drawn out to a capillary point, it became black, with evolution of a strong odor of phosphuretted hydrogen, which probably arose from the decomposition of the moist phosphorous acid. It did not fuse during the operation, and on cooling reacquired its original color. After the tip of the glass tube had been sealed up, the tube was inserted into another a little wider, and then strongly heated for a considerable time with the blowpipe. No sublimate was produced, nor had the substance undergone any change by its

exposure to a red heat. Boiled with solution of caustic potash, the substance evolved no phosphuretted hydrogen. Oil of turpentine dissolved much less of it than of ordinary phosphorus.

From this the author concludes that the so-called amorphous phosphorus does not deserve this name. It is rather a low oxide of phosphorus.—*London Chem. Gaz. Dec. 1, 1853, from Archiv der Pharm.*, lxxv. p. 136.

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## ON THE COMPOSITION OF BUTTER.

BY PROF. HEINTZ.

Since Chevreul's investigation of butter, that substance has been regarded as a mixture of several fats containing glycerine, for when saponified it furnishes various fatty acids, whilst glycerine is separated from all of them. These fatty acids are partly volatile and partly not volatile with watery vapor; partly fluid and partly solid at ordinary temperatures. The former, according to Chevreul, are butyric, caproic and capric acids; the latter, stearic and margaric acids. He considered the fluid acid to be oleic acid.

Lerch has since shown that a fourth acid, caprylic acid, was to be added to the first group; and Bromeis states that the fluid non-volatile acid of butter is a peculiar acid, distinct from oleic acid, and that its solid acid contains no stearic acid, but consists entirely of margaric acid.

As Heintz regards margaric acid as a mixture of stearic and palmitic acids, he was of course led to suppose that stearine and palmitine are contained in butter. This he ascertained with certainty in consequence of Bromeis having sent him a small quantity of the margaric acid prepared by him from butter. He succeeded by partial precipitation with acetate of magnesia in obtaining therefrom pure stearic and margaric acids.

The examination of a considerable quantity of butter has led the author to the following results.

The fluid non-volatile portion of the fatty acids produced by the saponification of butter is not a peculiar acid, butyroleic acid, distinct from oleic acid, as stated by Bromeis, but is completely identical with ordinary oleic acid. It is however very difficult to obtain compounds of this acid in a perfectly pure state directly from the butter. The baryta salt first prepared by the author contained

exactly the quantity of baryta attributed by Bromeis to the butyroleate of baryta. By minute separative methods, however, he at length succeeded in obtaining pure oleate of baryta, the composition of which agreed exactly with the formula  $C^{36} H^{33} O^3$ ,  $BaO$ .

From the solid portion of the acids obtained from the butter, the author procured a remarkably large quantity of pure palmitic acid, by the process already described by him for the separation of mixtures of fatty acids. He had however to contend with greater difficulties in preparing the stearic acid, which had been shown by previous experiments to exist in butter. These difficulties arose, to a considerable extent, from the small quantity of stearic acid existing in butter, but more especially from the circumstance that that substance contains another acid, which is richer in carbon, more difficult of solution in alcohol, and more readily precipitated by acetate of magnesia. This the author was unable to separate in a state of purity, in consequence of the small quantity of it present; he ascertained, however, that it must contain more than 38 atoms of carbon. From his investigations it appears very probable that its composition is to be expressed by the formula  $C^{40} H^{40} O^4$ . For this new acid the author proposes the name of *butic acid*. The solid portion of butter consequently contains *butine* and *stearine* in addition to *palmitine*.

Lastly, the author succeeded in procuring from the fatty acids of butter a small quantity of an acid which fuses between  $118^{\circ}$  and  $172^{\circ}$  F., and which, although it was not obtained perfectly pure, agrees so exactly in its properties and composition with myristic acid, that no doubt can be entertained that this acid also is contained in butter. Butter consequently contains *myristine*.

According to the investigations of Lerch, butter contains compounds of glycerine with—

Butyric acid, formula  $C^8 H^8 O^4$   
 Caproic acid, formula  $C^{12} H^{12} O^4$   
 Caprylic acid, formula  $C^{16} H^{16} O^4$   
 Capric acid, formula  $C^{20} H^{20} O^4$

The author found in addition compounds of glycerine with—

Myristic acid, formula  $C^{28} H^{28} O^4$   
 Palmitic acid, formula  $C^{32} H^{32} O^4$   
 Stearic acid, formula  $C^{36} H^{36} O^4$   
 Butic acid, formula  $C^{40} H^{40} O^4$

We thus arrive at the conclusion, that the entire series of the fats of the fatty acids, from butyric acid to butic acid, the composition of which may be expressed by the general formula  $C^{4n} H^{4n} O^4$ , is contained in butter, with the single exception of pichurmeic acid ( $C^{24} H^{24} O^4$ ), and that all those members of the series in which the number of equivalents of carbon are not divisible by 4, but only by 2, do not occur in it; a conclusion already arrived at by Görgey for cocoa-nut oil.

Butter consequently consists of a mixture of oleine with butyrine, caproine, capryline, caprine, myristine, palmitine, stearine and butine.—London *Chem. Gazette*, Dec. 1, 1853, from *Bericht-der Akad. der Wiss. zu Berlin*, Aug. 1853, p. 503.

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#### NEW PROCESS FOR DETERMINING THE COMMERCIAL VALUE OF ANIMAL CHARCOAL.

By M. CORENWINDER.

At present, when it is desired to determine the value of animal charcoal, it is usual to ascertain the amount of decolorizing power as compared with that of a charcoal, of which the properties are known, placing it as far as possible in the same physical condition as that which serves for comparison.

The decolorizing power of the charcoal ought undoubtedly to be taken into consideration; but this substance possesses another property, to which no serious attention has been paid, namely, an absorbent power.

In the present state of the sugar manufacture, the latter is certainly of more consequence than the decolorizing power, since, by means of centrifugal apparatus, the crystals of sugar may be completely freed from the colored syrup which adheres to them. Moreover, the absorbent power of the charcoal produces the same effect as the decolorizing power, which is evidently due to the absorption of the colored matters in solution in the syrup.

The comparative value of animal charcoal may consequently be determined from the quantity of lime which is absorbed by a given weight of that substance. This quantity, which is considerable with new charcoal, is much less with charcoal that has been revived; a process may therefore be founded upon this property, which will serve to give a determinate value to animal black; and

this so much the more because this very property is undoubtedly the one most important to the manufacturer, since it frees the syrups of a substance which is hurtful in the baking, and which prevents the crystallization of a certain quantity of saccharine matter.

This settled, it is easy to find a method by which every one may determine the value of animal charcoal. A solution of saccharate of lime is prepared; the number of degrees of the solution of sulphuric acid employed in alkalimetric analyses required to saturate a given volume (say 50 cub. centims.) of this saccharate is then determined.

This done, the samples of animal charcoal are reduced as nearly as possible to the same degree of fineness; equal quantities (say 50 grms.) of samples are then put into separate flasks, and an equal quantity (say 1 decilitre) of the saccharate added to each, and left in contact for about an hour. The liquids are then filtered separately; and the quantity of the normal solution of sulphuric acid required to complete the saturation of 50 cub. centims. of each of them determined; the difference will show the quantity of lime which has been absorbed by each sample of animal black. That which absorbs the most is undoubtedly the best for the consumer, and that to which he should give the preference.

The saccharate of lime and the solution of sulphuric acid may be prepared in the following manner:—

An acid liquid is first prepared, composed of 20 grms. of pure monohydrated sulphuric acid diluted with water to exactly 1 litre.

A solution of saccharate of lime\* is then prepared, of such a nature that it will be exactly saturated by the same volume of the dilute sulphuric acid. By adding the latter to 50 cub. centims. of the liquid filtered from the animal charcoal, it is easy to see how

\* If any given weight of lime would dissolve in a saccharine solution, it would require 11.40 grms. of pure lime to saturate 20 grms. of pure sulphuric acid; but as this is not the case, it is necessary to operate in the following manner:—

From 125 to 130 grms. of white sugar are dissolved in water, and 15 to 20 grms. of quick lime added thereto; the liquid is then boiled, and filtered to separate the undissolved lime. It is then necessary to ascertain how many degrees of the normal acid are required to saturate 50 cub. centims. of this solution; if it takes 125, we get the following proportion:— $125 : 100 :: 100 : x = 80$ . Consequently by taking 80 centilitres of the prepared saccharate, and diluting them with water to the volume of 1 litre, a solution of saccharate of lime is obtained, which saturates exactly its volume of the normal acid solution.

many degrees of the burette are required to complete the saturation of the lime. If 35 are required for this purpose, 100-35, or 65, represents the proportion of lime absorbed by the charcoal; this is the number representing its standard. By operating with a burette graduated from the bottom, the degree of the charcoal experimented on may be read directly.

The author adds, that if these numbers be depended upon for the calculation of the absolute lime-absorbing power of the charcoal, they will lead to error, as it appears that this substance absorbs a large quantity of lime in proportion as the quantity in the solution is larger. An equilibrium is set up between the action of the charcoal, the dissolving force of the water, and the capacity of the saturation of the sugar, which varies according to the quantity of these elements in the solution.—*Chem. Gaz. Jan. 1, 1854, from Comptes Rendus, Oct. 17, 1853, p. 610.*

#### ON THE UNCERTAINTY OF THE COMPOSITION OF PHARMACEUTICAL PREPARATIONS, AND THE MOST ELIGIBLE FORM OF MEDICINES FOR ADMINISTRATION.

By W. B. CHAPMAN, M. D., of Cincinnati.

The uncertainty of the purity and strength of remedial agents is a serious inconvenience to the practitioner of medicine, and one over which he has but little control, as he must depend mainly upon the druggist from whom he purchases his stock; and, although we have laws which require the inspection of drugs and chemicals that are imported into the United States, and which doubtless have operated beneficially in keeping from our markets large quantities of inferior articles, still much watchfulness is requisite to prevent sophistication at home by unprincipled dealers, whose only object is "to buy, sell, and get money; get it honestly if they can, if not, get it."

This is a subject of vast importance, and one which should engage more of the attention of the practitioner than it usually does, for how is it possible for him to do justice to his patient or himself whilst there is so much uncertainty in the quality of the agents he may wish to employ?

How are we to ascertain the purity of our articles? Most per-



sons in ordinary mercantile pursuits may judge sufficiently of the quality of many articles of merchandize from mere superficial examinations; but not so with drugs and medicines.

Who is there that can say, from a casual inspection, whether the Iodide of Potassium of commerce does or does not contain from ten, fifteen or twenty per cent. of impurities, or that the Sulphate of Quinine has not been adulterated by the admixture of Salicine, Mannite, &c.; or that the powdered Cinchona bark is or is not mixed with the powdered Maricaibo or Carthagenia barks; or, lastly, that the powdered Rhubarb has not been made from black, rotten and wormeaten roots, those which were wholly unsaleable in the crude state, and which were colored and mixed with foreign material, so as to appear of the first quality? Then how are physicians to judge of their qualities when, even if they had the time to spare from their professional labors, they have not the necessary apparatus for such investigations?

In our solicitude for obtaining articles of the best quality from foreign countries, the importance of having the pharmaceutical preparations of home manufacture equally as good, should not be overlooked. We have no guaranty of their being properly prepared, both as to the proportions and quality of the articles used in their composition, but the integrity and competency of the manufacturer.

We have a Pharmacopœia, promulgated by a National Medical Convention, which meets every ten years at the City of Washington, for the purpose of making such alterations and additions as may be found necessary from experience; and this work should be the guide of every apothecary, and physicians should in all cases conform their prescriptions to it as far as practicable. In following it strictly no physician or apothecary can carry out the directions unless he is in possession of the right weights and measures. The troy, or apothecary weights, and the wine gallon and its subdivisions, are absolutely requisite in compounding, and should always be used, except when special mention is made to the contrary.

An instance or two may show more clearly what we are endeavoring to impress upon the minds of physicians. For instance, in the preparation of the Tincture of Opium, the directions are to take of Opium, in powder, two ounces and a half; of Diluted Alco-

hol two pints; macerate for fourteen days, express and filter through paper. Now two and a half ounces troy or apothecary's weight are

1200 grains.

Two and a half ounces avoirdupois are

1093 $\frac{3}{4}$  grains.

Making a difference of

106 $\frac{1}{4}$  grains.

But as ordinarily prepared this is not all the difficulty. It will be observed that powdered Opium is directed. Opium, in drying, so as to admit of its being powdered, will lose, on an average, one-third of its weight; therefore, in using the moist gum in the preparation of the tincture only 740 grains will be employed, which is but a little over one-half of the requisite quantity. The object of having the Opium powdered is to insure a greater uniformity in the strength of the tincture, and to be more readily acted upon by the menstruum, than if permitted to remain in hard dry masses.

We will now cite an instance of a different character, viz: the preparation of Mercurial Ointment. The directions are,

Take of Mercury two pounds,

“ Lard twenty-three ounces,

“ Suet one ounce.

Rub the mercury with the suet and a small portion of the lard until the globules disappear, then add the remainder of the lard and mix.

Two pounds apothecaries weight are

11520 grains.

twenty-three ounces apothecaries weight are 11040 }  
one “ “ “ 480 } 11510 grs.

That is, equal weights of fat and mercury.

Two pounds avoirdupois weight are

14000 grains,

twenty-three ounces do.

10062 $\frac{1}{2}$  }  
one do. do. 437 $\frac{1}{2}$  } 10500 grs.

Which shows an excess of 3500 grains, or half a pound avoirdupois weight, of Mercury.

These two instances should be sufficient to satisfy any person of the importance of strictly adhering to the prescribed rule.

As regards the administration of medicines: For the last few years the pharmacist and physician have been laboring to concentrate medicines, and at the same time to render the various

preparations more acceptable to the palate of the patient. An infinite number of proximate principles have been produced, some deserving a trial at the hands of the physician, others no doubt may be considered almost useless; but amongst the new pharmaceutical preparations we believe that one of the best forms for the concentrated medicines of vegetable origin is that of *fluid extract*. We will state some of the objections which are urged against tinctures, decoctions, &c., and the advantages of fluid extracts over other preparations.

The objections to the administration of tinctures are that, in many cases, their long continued use in chronic affections is apt to result in habits of confirmed intemperance, together with the fact that the stimulating properties of the Alcohol frequently overbalance the benefit derived from the employment of the remedy. This is particularly the case where the dose of the medicine is large, as in the Compound Tincture of Gentian, Compound Tincture of Senna, &c. Another objection which is urged against them is, that when prepared with proof spirits or diluted Alcohol they undergo after a time the acetous fermentation, by the conversion of the Alcohol into Acetic acid, by the catalytic influence of the nitrogenous matter in solution, and which greatly impairs the power of the agent. This is particularly the case with the tinctures of Senna, Rhubarb, Colombo, Hyoscyamus, Digitalis, Cinchona, Hops, Aloes, and the Compound Tincture of Cardamom.

Decoctions, by the influence of the air and the mutual reaction of their components, decompose in a very short space of time, and if the active principle be volatile, it will be dissipated, thereby rendering them inert. Infusions, too, spoil very soon, especially in warm weather, and are subject to many of the objections urged against decoctions.

It is not an uncommon occurrence, in private practice, for a physician to direct an infusion of Rhubarb or Senna to be given to his patient—but instead of infusion, a decoction will be prepared, and probably “to get out all the strength” the root or leaves will be kept boiling for an hour or two, and the effect is obvious: instead of a gentle laxative, in the case of Rhubarb, you have a preparation of the opposite character, and Senna will be found to possess all of its griping qualities in perfection, with very little of its cathartic powers.

Of the advantages of fluid extracts over the crude material it is hardly necessary to speak; the object is to separate the effete matter from the active principle by employing the proper menstruum in all cases as the solvent, and also to concentrate and have an uniformity of dose as far as practicable, which is a great desideratum, and can generally be accomplished better in this form than in any other.

There is another form of remedial agents we wish to mention in this connection, which should receive the attention of the physician, viz.: that of "Saccharated Medicinal Powders"—a few remarks on which we copy from the "Annals of Pharmacy: "

"Some of the most useful of our pharmaceutical preparations are those known as Tinctures, which hold in solution many of the most active principles of vegetable substances. Yet as Alcohol, either pure or more or less diluted with water, constitutes the greater part of their composition, the frequent administration of this substance is occasionally open to serious objections, both on the part of the physician and his patient. For this reason Dr. Becker recommends the employment of Saccharated Medicinal Powders as substitutes for Tinctures, whenever the latter may be considered objectionable. He directs equal proportions of the Tinctures of Hellebore, Cinchona, Hyoscyamus, or of other vegetable substances, as the case may be, and sugar, to be well mixed together, and then evaporated, so as to drive off the Alcohol, and then to administer the residue instead of the Tincture. To this residue he gives the name of Helleborus Saccharatus, Hyoscyamus Saccharatus, Cinchona Saccharata, &c., &c., according to the drug made use of."

This mode of preparation of medical substances has attracted the attention of some of the medical authorities of our own country, for in reference to this subject the editor of one of the medical journals makes the following practical observations: "Supposing the unimpaired medical properties of the Tinctures can be thus fixed in these powders, (which is problematical,) this mode of administration would prove a great boon to physician and patient. Not only is Alcohol obviously mischievous in many cases wherein the active principles of which it is the vehicle are indicated, but in others, in which such contra-indication is not so apparent. It

has often proved a means of inducing a habit of dram-drinking, which prevails even among respectable females to a far greater extent than is usually supposed.”—*Transactions of the Ohio State Medical Society.*

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#### IRON ALUM.

The Curator, Mr. Greaves, drew the attention of the meeting to a specimen of *Iron Alum*, which had been sent by Mr. Lindsey Blyth, of St. Mary's Hospital, accompanied by a note, which was read. The object of Mr. Blyth's communication was, to describe the composition of the salt which has recently been prescribed by some of the medical officers attached to St. Mary's Hospital, under the name of *Iron Alum*, to explain the circumstances under which it was first brought under their notice, and the process which had been adopted at the hospital for making it. The salt first used at St. Mary's Hospital was part of a sample obtained by Mr. Davenport as a bye-product in the preparation of some ferruginous compounds. It was found by Dr. Tyler Smith to be a more powerful astringent than common alum, and not liable to produce the stimulating effects of other salts of iron. The salt obtained from Mr. Davenport consisted of sulphate of peroxide of iron and sulphate of ammonia, having the constitution and crystalline form of common alum. Some of the salt had been prepared by Messrs. Hopkin and Williams, and it had subsequently been made at the hospital, both with potash and ammonia. It was well known that the name Alum had for some time past been applied by Chemists, as a generic designation, to a long series of salts which coincided with common alum in constitution and form. Thus, common alum, which is usually viewed as a double salt, consisting of sulphate of alumina and sulphate of potash, being taken as the type, iron alum is formed by substituting peroxide of iron for the alumina. And as, in common alum, the potash may be replaced by ammonia or soda as well as by many other protoxides, so a similar replacement may be effected in iron alum without altering the type. Mr. Blyth directed the attention of those who had not particularly studied this subject, to a table representing the composition of some of the salts which have been described under the generic name of alum.

*Series of Alums described by different Authors.*

General formula  $M_2 O_3, 3 SO_3 + MO, SO_3 + 24 Aq.$

## COMMON ALUM.

With Potash  $Al_2 O_3, 3 SO_3 + KO, SO_3 + 24 Aq.$   
 " Soda  $Al_2 O_3, 3 SO_3 + NaO, SO_3 + 24 Aq.$   
 " Ammonia  $Al_2 O_3, 3 SO_3 + NH_4O, SO_3 + 24 Aq.$   
 " Magnesia  $Al_2 O_3, 3 SO_3 + Mg O, SO_3 + 24 Aq.$   
 " Lithia  $Al_2 O_3, 3 SO_3 + Li O, SO_3 + 24 Aq.$   
 " Manganese  $Al_2 O_3, 3 SO_3 + Mn O, SO_3 + 24 Aq.$   
 " Iron  $Al_2 O_3, 3 SO_3 + Fe O, SO_3 + 24 Aq.$

## IRON ALUM.

With Potash  $Fe_2 O_3, 3 SO_3 + KO, SO_3 + 24 Aq.$   
 " Soda  $Fe_2 O_3, 3 SO_3 + NaO, SO_3 + 24 Aq.$   
 " Ammonia  $Fe_2 O_3, 3 SO_3 + NH_4O, SO_3 + 24 Aq.$

## CHROME ALUM.

With Potash  $Cr_2 O_3, 3 SO_3 + KO, SO_3 + 24 Aq.$   
 " Soda  $Cr_2 O_3, 3 SO_3 + Na O, SO_3 + 24 Aq.$   
 " Ammonia  $Cr_2 O_3, 3 SO_3 + NH_4 O, SO_3 + 24 Aq.$

## MANGANESE ALUM.

With Potash  $Mn_2 O_3, 3 SO_3 + KO, SO_3 + 24 Aq.$   
 " Soda  $Mn_2 O_3, 3 SO_3 + Na O, SO_3 + 24 Aq.$   
 " Ammonia  $Mn_2 O_3, 3 SO_3 + NH_4 O, SO_3 + 24 Aq.$

It would be seen from this table that many of the salts to which the term *alum*, in its most comprehensive sense, was applied, and including the iron alum in question, contain no alumina. He had been principally induced to bring the subject under the notice of the meeting in consequence of some doubt and misapprehension having existed among Pharmaceutists to whom prescriptions ordering iron alum had been taken, as to the salt intended to be indicated by that term. As already stated, the salt now used at St. Mary's Hospital is the double sulphate of peroxide of iron and potash. It is prepared either by dissolving peroxide of iron in sulphuric acid, or by peroxidizing protosulphate of iron with nitric acid, and adding an equivalent of sulphate of potash. If the salt with ammonia be required, sulphate of ammonia is added instead of sulphate of potash. The solution, with excess of sulphuric acid, is to be evaporated until crystals are formed on cooling.

Next to common alum and chrome alum, this is the one most easily formed of the whole series. It forms a beautiful salt, being of a pale violet color. It is more soluble than common alum, the solution having a reddish color. It may be distinguished from an alum containing protosulphate of iron, by the color of the precipitate formed on the addition of caustic potash, which, with the salt under notice, will be brown, while with the other it will be green.

Mr. Davenport stated that the preparation referred to in the note just read, under the name of Iron Alum, was obtained by him quite casually from a solution of persulphate of iron. It presented the octahedral form of common alum, and upon examination, was found to contain sulphate of ammonia and sulphate of peroxide of iron, but not a trace of alumina. This so-called iron alum was now introduced as a successful remedial agent, and would no doubt be classed among the pharmaceutical preparations of the day. He thought the name Iron Alum an objectionable one to apply to this salt, and his object in making these remarks, was principally to suggest the adoption of a more distinctive appellation. It had been very properly shown by Mr. Blyth, not only that there are a great many alums, differing entirely in composition, but also that there are several iron alums. It was important that the substances used in medicine should be clearly defined, and he would therefore suggest that this salt when ordered in medicine should be called *Ammonia-sulphate of peroxide of iron*, when the ammonia salt was intended, or *Potassio-sulphate of peroxide of iron*, if it were intended to indicate the potash salt.—*Pharm. Journ.*, Jan. 1854.

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#### BROMINE AND IODINE IN CHILI NITRE.

From the daily increasing consumption of Chili nitre, it is advisable that some attention should be paid to the small quantities of iodine and bromine present in it. These substances would be accumulated in the mother-liquors of the refining operations, and their quantity would render them worth extraction.

Rebling states, that in the liquors from the purification of 25 lbs. of Chili nitre, amounting to a few pounds, he obtained by the addition of a solution of sulphate of copper in sulphurous acid water, a precipitate equivalent to 4.5 grs. iodide of sodium.



The purification was effected in the following manner:—The salt, broken into pieces about the size of peas, was briskly agitated with cold water for a few seconds, and the liquid poured quickly off before the suspended matter was deposited. This operation was repeated a few times until the salt was colorless, when it was drained upon a funnel and washed with pure water until no further reaction with silver salt was given.

Grüneberg has examined the liquid which flowed spontaneously from 50 tons of raw Chili nitre that had been stored in a damp place and the mother-liquors obtained from the subsequent purification of this nitre.

He first proceeded by removing from these liquors as much as possible of the crystallizable salts, chloride of sodium and nitrate of soda. During the evaporation for this purpose a remarkable circumstance presented itself. As the concentration increased the liquid became more turbid and brown, evolving a sensible odor of iodine, and when treated with starch gave a deep blue color.

It subsequently appeared that this was owing to a decomposition of iodide of magnesium. The addition of caustic soda prevented this inconvenience.

When the liquids had been concentrated as much as possible they weighed 90 lbs. The iodine was separated by heating with iron filings and adding gradually sulphate of copper as long as there remained any iodine or iodic acid in solution. During the precipitation the liquid again became brown from the liberation of iodine. By this action of sulphate of copper upon iodide of sodium  $= 2 (\text{I Na}) + 2 (\text{Cu O SO}_3)$  there were produced  $2 (\text{Na O SO}_3) + \text{Cu}_2 \text{I} + \text{I}$ . The brown color was, however, removed by the gradual action of iron filings, for from  $\text{I} + 2 \text{Fe} + 2 (\text{Cu O, SO}_3)$  there were produced  $2 (\text{Fe O SO}_3) + \text{Cu}_2 \text{I}$ , so that all the iodine of the iodide of sodium was ultimately converted into iodide of copper, while the iodine of the iodates was contained in the precipitate as proto-iodate of iron and iodate of copper.

This precipitate washed, dried, and mixed with broken glass, to render it more porous, was treated with sulphuric acid and oxide of manganese. On distillation the action was at first violent, and a large quantity of iodine mixed with chloride of iodine passed over. The water into which the product of distillation passed became brown from the solution of chloride of iodine, which after a

time began to decompose and deposite iodine, generating at the same time oxygen and hydrochloric acid.

Grüneberg obtained in this manner 18 ounces of iodine.

In order to obtain the bromine, the liquid from which the iodide of copper had been precipitated was filtered, evaporated to the consistence of a syrup mixed with oxide of manganese and sulphuric acid, distilled, and the products of distillation led into a solution of caustic potash. The bromine obtained amounted to somewhat more than half an ounce.

According to these results the Chili nitre would contain

Iodine	.	.	0.000010
Bromine	.	.	0.000005

*Pharm Journ.*, Jan. 1854.

## Varieties.

*New Alkaloids.*—How has studied the action of the iodids of methyl, ethyl and amyl upon morphine and codein. When finely pulverized morphine is digested in a closed tube with an alcoholic solution of iodid of ethyl, a white crystalline substance separates, which, after recrystallization, is obtained in fine white needles. These are the iodid of ethyl-morphin, the formula of which is  $C_{34}H_{18}(C_4H_5)NO_6 + HI$ . The base was isolated by treating the iodid with oxyd of silver, and appeared as a very caustic liquid of a reddish brown color; which gave no crystals on evaporation, but only a semi-transparent dark colored mass which was deposited from a boiling solution in alcohol as a boiling in alcohol as a microscopic crystalline mass. This powder is readily dissolved in muriatic acid to a yellow solution, which gives heavy yellow precipitates with chlorid of platinum and bichromate of potash. The oxyd is readily soluble in water; its probable formula is  $C_{34}H_{18}(C_4H_5)NO_6$ . With iodid of methyl a similar base was produced, the iodid of which has the formula  $C_{34}H_{18}(C_2H_5)NO_6 + HI$ ; the author terms it methyl-morphin. When morphin is heated with chlorid of amyl, fusel oil and chlorid of morphin-ammonium are produced. Codein digested with iodid of ethyl yields a highly crystalline colorless substance which is the iodid of ethyl-codein-ammonium, and which has the formula  $C_{36}H_{20}(C_4H_5)NO_6 + HI$ . Iodid of methyl yields a similar compound with codein. Methyl-morphin is isomeric with codein, but differs from it in chemical and physical properties.—*Journal für prakt. Chemie*, lix, 489.

*Preparation Valerianic Acid from Fusel Oil.*—GRUNEBERG recommends the following proportions as the most advantageous.  $2\frac{3}{4}$  lbs. of bichromate of potash are to be introduced into a retort, and  $4\frac{1}{2}$  lbs. of hot water poured upon the salt. A cooled mixture of 1 lb. of fusel oil and 4 lbs. of sulphuric acid diluted with 2 lbs. of water is to be allowed to flow very slowly and in a thin stream into the liquid in the retort, and the whole is then to be distilled. The distillation goes on quietly, and 9 ounces of oily valerianic acid are obtained.—*Silliman's Journal*, Jan. 1854, from *Journal für prakt Chemie*, lx. 169.

*Preparation of Pure Caustic Potash.*—WÜHLER has given a very simple and elegant method of preparing caustic potash in a state of chemical purity. One part of pure saltpetre in powder is to be mixed with from two to three parts of metallic copper cut into small pieces, and the whole heated to a moderate red heat for half an hour in an iron, or, better still, in a copper crucible. After cooling, the mass is to be treated with water, and the resulting lye poured into a narrow cylinder which is then to be carefully closed. After the oxyd of copper has completely settled, the supernatant liquid may be drawn off with a syphon. It contains no traces of copper. The solution is best preserved free from carbonic acid by Mohr's method, namely by closing the bottle with a cork through which passes airtight a tube open at both ends, and filled with a coarse mixture of Glauber salt and caustic lime. Iron decomposes saltpetre as completely as copper, but it cannot be employed to prepare pure potash in consequence of its containing carbon, silicon, phosphorus, &c. When the above proportions of copper and saltpetre are used, a portion of the copper is obtained in the form of suboxyd. For a second operation we may take 1 part of nitre, 1 of this oxyd, and 1 of metallic copper. After complete washing, the oxyd of copper may be dissolved in sulphuric acid, and thus converted into blue vitriol.—*Annalen der Chemie und Pharmacie*, lxxxvii. 373.—[This process will be particularly convenient if, as appears probable, the resulting oxyd of copper is in a proper condition to be used in organic analysis. If not, it might be reduced at a low red heat by coal gas, and again employed to decompose nitre.—w. g.]—*Silliman's Journal*, Jan. 1854.

*On the Polarization of light by refraction through a metal.*—BIOT found that two gold leaves are sufficient to polarize direct solar rays completely. ROLLMANN has examined the subject anew, and has employed the gold leaves both as a polarizing and as an analyzing arrangement. When the light is very intense, only a single leaf can be employed, as otherwise the field of view appears too dark. When used as an analyzer, a gold leaf shows very distinctly the colors of thin plates of gypsum, cooled glasses, &c., but these are naturally modified by the peculiar blue green color of the gold. If we allow plane polarized light to pass through an inclined gold leaf, and examine by a tourmaline in the light so transmitted a plate of calc spar cut

perpendicular to the axis, we shall observe the phenomena of elliptic polarization, when the gold leaf and the analyzer are turned to an angle of  $45^\circ$  with the planes of polarization. The colored rings are narrower in the first and third quadrants than in the second and fourth, the cross is converted into two hyperbolas, whose branches do not meet. When in the above experiment, we leave everything else unchanged, and examine the calcspar with the analyzer, by means of the light reflected from the gold leaf in place of that transmitted, we observe the complementary figure such as we obtain it when we employ the transmitted light, and tourmaline is turned through  $90^\circ$ . The tourmaline must be green in order to transmit the light well. Brewster's discovery of the elliptic polarization by metallic reflection is thus extended and completed.—*Ibid*, from *Pogg. Ann.*, xc, 188.

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*Vitrification of Photographic Pictures.*—The author of this process, M. Plaut first procured a photograph on glass covered with albumen, and subjected it gradually to a strong heat so as to redden the glass. The albumen was destroyed, and the photograph, if negative, became positive by reflection. The picture was made of pure silver which adheres quite strongly to the glass, so that it may be polished without alteration.

On exposing this glass to the action of hydrofluoric acid in vapor, an engraving of the design is obtained over parts not covered by the image formed of the silver. It may also be possible to strengthen the image by a galvanic deposit, and make a kind of plate from which engravings could be taken.

If, in place of arresting the process at a red heat, it is continued until the glass enters into fusion, the image sinks into the interior of the glass without being altered, and covers itself with a vitreous varnish. It appears like a design of great delicacy, enclosed between two plates of glass; and if positive proofs are employed, the method may be used for making pictured glass which may without doubt be colored by the ordinary processes.—*Ibid*.

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*Photographic Portraits on linen cloth.*—The *Revue Encyclopedique* of the Abbe Moigno, from which we have taken the preceding note, states that the problem of making photographs on linen has been resolved. The Abbe Moigno has assisted at the operations of M. Wulff, the inventor; he says nothing of the processes, and we only know that the photographs were taken on linen covered with celloidien.—*Ibid*.

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*Artificial magnets.*—For some time, permanent magnets have been made from cast iron by the aid of an electric current. The only difficulty consists in tempering the metal. M. Florimond, Professor of Physics at Louvain has recently given the results of some investigations on this subject to the Academy of Sciences of Brussels, detailing the effects from using magnets of this kind in the construction of magneto electric machines, these magnets being much more economical on account of the difference in value of cast iron and steel. The following are some of his conclusions:

1. Gray metal gives more satisfactory results than white metal, which is moreover too brittle.

2. Magnets tempered at a low red heat lose all their magnetism in twenty-four hours.

3. They retain their magnetism perfectly when tempered at a bright red heat.

The following is the method of obtaining the maximum magnetic power. The bars are heated to a red heat in a blast furnace; they are taken out, and powdered over the two faces for  $\frac{1}{4}$ ths their length with the yellow prussiate of potash pulverized, and then are plunged immediately into a large quantity of cold water, with violent agitation. When the bars are cooled, they are magnetized by means of a horse shoe electro-magnet capable of lifting about 200 kilograms. The two poles of the magnet are applied at the place where the branches of the cast iron magnet become parallel; the poles are made to slide quite to the extremities of the branches, and then detached to repeat 3 or 4 times the same process of friction. After operating thus upon one of the faces, the other is subjected to the same treatment, taking care that the same poles are brought into contact with the same branches.

The poles of the bundle of cast iron magnets ought to be always kept in contact with an armature of wrought iron of a size proportional to that of the bundle. The bars of cast iron should be a little thicker than those of steel.—*Ibid.*

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*Mode of obtaining Camphor from Oil of Sassafras.* By M. FALTIN.—M. Faltin found that during the action of chlorine gas upon oil of sassafras, the latter becomes converted into a thick tough mass, whilst a large quantity of hydrochloric acid is formed. After neutralization with milk of lime, this mass furnishes on distillation a small quantity of camphor, which is perfectly identical in its properties and composition with common camphor. It could only be obtained from the oil by the action of chlorine. It is probably produced from the unoxxygenated oil contained in the oil of sassafras. This observation therefore possesses some interest, as the Sassafras tree belongs to the *Laurineæ*, the same family which includes the Japanese camphor-tree.—*Chem. Gaz.* Nov. 1853, from *Ann. der Chem. und Pharm.*, lxxxvii. p. 376.

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*Patent granted to P. Warren, for a Substitute for Papier-maché, &c.*—This invention consists in manufacturing a new material or composition of a character analogous to papier-maché, which is capable of being employed either as a substitute for papier-maché or gutta percha, and its compounds, in forming or manufacturing various articles for which these substances are now used, such as panels and mouldings for railway carriages, trays, picture and other frames, door knobs, buttons, &c., by treating the straw of any fibrous vegetable material hereinafter described. In order to carry out this

invention, straw of any fibrous vegetable substances, such as wheat, barley, oats, rye, and other similar straws, are cut into short lengths by means of any suitable cutting machine. When these straws have any knots, it is necessary to open out and divide the same, which is effected by passing the straw through a pair of millstones, or between crushing rollers; or they may be submitted to the action of any other equivalent apparatus, so that the knots and fibres may be thoroughly and effectually separated and divided. In some cases, either hot or cold water, or other liquid is applied to the materials under operation, in order to facilitate this process. The cut and divided straw is then boiled in a strong alkaline lye, or solution of caustic alkali, such as soda, potash, &c., until a pulpy mass is produced—which effect will, however, greatly depend on the nature of the straw operated on, and the strength of the alkaline lye or solution which is employed. The mass is then transferred to the machine known in the paper-making trade as the rag-engine, where it is reduced to pulp in the manner usually practised when operating on rags, &c., in the manufacture of paper. The pulp is then partially dried, in which state it may be pressed or rolled into sheets, or moulded into other forms. These sheets or moulded articles are then dipped into oleaginous or glutinous matter or oil, and are afterwards baked in an oven similar to that employed when manufacturing sheets or moulded articles of papier-maché.—Sealed October 12, 1852.—*Chem. Gaz.*, Nov. 1853.

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*On Lævo-camphoric Acid and Camphor with a Rotatory Power to the Left.* By J. CHAUTARD.—The author has obtained from *Matricaria Parthenium* a camphor which deviates the plane of polarization to the left, whilst the camphor of the *Laurineæ* deviates it to the right.

By treating this camphor with nitric acid in the way indicated for the conversion of common camphor into camphoric acid, a new acid was obtained, which deviates the plane of polarization to the left exactly to the same extent that ordinary camphoric acid deviates it to the right, and standing to the latter in exactly the same position as lævo-tartaric acid to dextro-tartaric acid.

These two acids exhibit the most complete identity in their physical properties. If lævo and dextro-camphoric acids be mixed in equal quantities, they combine immediately, furnishing a new acid completely distinct from its own components, and entirely without action on polarized light. This may consequently be called *racemo-camphoric acid*.

The camphor of the *Matricaria* has the same solubility, the same points of fusion and volatilization, and the same power of rotation as the camphor of the *Laurineæ*.—*Chem. Gaz.*, Dec. 1853, from *Comptes Rendus*, August 1, 1853, p. 166.

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*Oil of Pumpkin-seeds for Tape-worm.*—Dr. H. S. Patterson, of Philadelphia, recommends, in the Oct. number of the *Medical Examiner*, the oil of

pumpkin-seeds for the treatment of tape-worm. He reported in the same journal, in October of last year, a case of radical cure by an emulsion of these seeds, after turpentine and even kousso had signally failed. He reports a case which came under the care of a medical student in that city, in which the oil was used by him at his request, and with the happiest result. Half an ounce of the oil was given in the morning, and the same quantity in about two hours more, followed at the end of another two hours by an ounce of castor oil, with the effect of bringing away a considerable part of the worm; and as the patient had been entirely free from every symptom of verminous irritation from May to September, he thinks there is no doubt that the worm is entirely destroyed. The oil is obtained from the seeds by cold expression.—*New Hampshire Journal of Medicine*, Jan. 1854.

CHARTA EXPLORATORIA CÆRULEA. *Blue test paper*.—This is prepared by dipping slips of paper in a strong and clear infusion of litmus; or by brushing the infusion over the paper. Bibulous or unsized paper is usually preferred, on account of the facility with which it imbibes the liquid to be tested, and also because the alum which frequently enters into the composition of the size affects the color of the litmus. Prof. Graham, however, recommends good letter paper; or, if the infusion is applied on one side only, thin and sized drawing paper. Faraday recommends the infusion to be prepared from an ounce of litmus, and half a pint of hot water. The Prussian Pharmacopœia of 1827 orders one part to four of water. Others employ one to six parts.

In order to obtain *extremely delicate* test paper, the alkali in the litmus is to be almost neutralized by a minute portion of acid. To effect this, divide the filtered infusion of litmus into two parts; stir one portion with a glass rod which has been previously dipped in dilute sulphuric acid, and repeat this till the liquid begins to look reddish: then add the other portion of liquid and immerse the paper in the mixture.

Good litmus paper should be uniform in its color, and neither very light nor very dark. When it has a purplish tint it is a more delicate test for acid than when its color is pure blue. When carefully dried it may be preserved by wrapping it in stiff paper, and keeping it in well stopped bottles in a dark cupboard or drawer.—*Percira's Materia Medica*.

*Malate of Lime in the leaves of the Common Ash*.—The leaves of the ash have latterly been used medicinally. They are said to be serviceable in gouty affections, and, according to Emile Mouchon, purgative.

The brothers Garot have examined them chemically, and find that they contain malate of lime, which is extracted by simple infusion. From one kilogram of the leaves they obtained fifty grm. of malate of lime. They have not analysed the acid.—*Pharm. Journ.* Feb. 1854.



## Editorial Department.

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THE AMERICAN PHARMACEUTICAL ASSOCIATION.—The next meeting of that body will take place at Cincinnati, Ohio, on Tuesday, the 25th of July, 1854, at eleven o'clock, A.M. It is to be hoped that those of the brethren who keep alive a little flame of interest towards the Association and its objects, will spontaneously spread the knowledge of its existence and intentions. We take pleasure in directing the attention of our readers to the remarks of the Secretary, at page 115, of the present number. It is also gratifying to observe that the Statistical Committee are giving unmistakeable evidence of their earnestness. The importance of the results they aim at, to the future usefulness of the Association, is so certain, that the gentlemen who may be called upon by circular for information, will be doing real service by giving the fullest information they possess. In our opinion it is entirely in consonance with the objects of the Association, to receive communications, on scientific or professional subjects, from individuals, and the reading of such will undoubtedly enhance the interest of the meeting and the value of the published proceedings. We, therefore, hope that any pharmacist, (whether a member or not,) who may have made scientific observations, or who may have views important to the pharmaceutical interests of the country, will feel free to bring or send them. If they should prove of sufficient interest for publication, the meeting will doubtless direct such disposition to be made: if not, they will be laid on the table. Of course it would be proper for all such communications to be brought forward by a Committee appointed to examine them, which would prevent any inappropriate matter from wasting the time of the meetings.

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LEGISLATION AGAINST QUACKERY IN VIRGINIA.—OPPOSITION BY THE DRUGGISTS.—The history of the recent movement in the Virginia Legislature against quackery, would take more space than we have at command. It is to be regretted that our brethren should have been placed in such a dilemma, by the hasty action of a few members of the medical profession, as to have found it necessary to raise their voices in favor of quackery, rather than suffer in their business. It is a lamentable instance of the impolicy of the compulsory reform of abuses that are clearly interwoven with the customs of society, without having previously prepared the way; and especially it proves, in this country, where popular opinion has a powerful influence on legislative action, that such attempts, however good the object, as in this instance, only react in favor of the abuses attacked. If the bill had been matured with the sanction of the Druggists, and made prospectively effective—say at the end of a year, or two years—the Old Dominion, so often the leader in great movements, might have successfully commenced the attack on this great system of evil, and have led to its ultimate downfall.

The following is taken from the *Richmond Mail*. The comments of the editors of five of the Richmond papers, were entirely in opposition to the bill, but whether their sympathy with quackery had any connection with their income from quack advertisements, we are not prepared to determine.

*Meeting of the Druggists.*—At a meeting of the Druggists of Richmond held in their Society Hall, Mr. Alexander Duval was called to the Chair, and Wm. S. Beers, Esq., appointed Secretary.

Mr. John Purcell offered the following preamble and resolutions, which were unanimously adopted:

That whereas a certain bill, entitled "a bill requiring that the box, bottle, or envelope containing any nostrum or quack medicine exposed for sale in this Commonwealth shall have connected therewith a label in which the ingredients of such nostrum or quack medicine shall be printed in English," is now pending in the Senate of the State, which had its origin with certain members of the profession in this city, who have endeavored to strengthen its position by the influence and action of the Medical Society of Virginia, which will seriously interfere with us in our business, and by so doing injuriously operate on the commercial interests of the city and State, by forcing beyond our border such trade as we now have from Tennessee and North Carolina, and injure the revenues of the State; and whereas we regard this effort on the part of such physicians as a mere scheme to put money in their pockets, and force such as are now relieved by the use of such medicines to resort to them for trivial diseases when they might be as effectually and more cheaply relieved by many of the standard specific medicines, now before the public; and whilst we do not intend to give recommendation to any of the class of remedies alluded to, yet the public, who have used them and have tested their efficiency, yield to them a reputation which gives them a currency, and value with the people; and, moreover, whilst we have no desire to enter the lists with the physicians, yet we feel that this effort on their part is a violation of the spirit of the Code of Ethics, formed for our mutual government. Therefore,

1st. *Resolved*, That whilst we, in common with others of our fellow-citizens, look to our household, yet we have an ardent desire for the prosperity of the City and State, and will deprecate any action of the Legislature which may tend, however remotely, to injure the Commerce of either.

2d. *Resolved*, That we would regard the passage of this bill as an act of tyranny and a violation of our personal rights and the rights of the people.

3d. *Resolved*, That whilst we do not give any special recommendation of any particular one of the many proprietary medicines before the public, yet we know that many of them are good in their effects, and we are supported in the opinion by the concurrent testimony of not only thousands of the people of the State, but by many physicians who have prescribed them.

4th. *Resolved*, That when we adopted, in conjunction with the Medical Society, a Code of Ethics for our mutual government, we did so in good faith, and it was not claimed that these medicines, now become so objectionable to certain physicians, were ostracised or aimed at by the Code.

5th. *Resolved*, That this action on the part of the physicians relieves us from all obligations longer to adhere to the Code as a Compact, the spirit of which they have violated.

6th. *Resolved*, That we regard this measure, coming as it does from physicians, as an evidence of the value of the class of medicines so attacked, and originating not so much from a desire to subserve the good of the public as for the promotion of their own personal interest.

7th. *Resolved*, That we have heretofore and will continue to act with be-

coming courtesy and good faith towards physicians, but we will not submit to any improper dictation on their part—regarding ourselves as co-operative but not subordinate, and we regard any intermeddling with our business as gratuitous and unbecoming.

8th. *Resolved*, That a committee of three be appointed to secure the co-operation of the Druggists of the State in our action.

The Chairman appointed Messrs John Purcell, Wm. S. Beers, and Andrew Leslie.

Mr. J. T. Gray offered the following resolution, which was adopted :

*Resolved*, That a committee of three be appointed to represent our interests in any and every matter that may be brought before the Legislature, and that said committee be clothed with full powers.

The Chair appointed Messrs S. F. Adie, P. W. Grubbs and Chas. Mills-paugh said committee.

ALEXANDER DUVAL, *Chairman*.

WILLIAM S. BEERS, *Secretary*.

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PROFESSORIAL METAMORPHOSIS.—The curious changes which the insect undergoes in obedience to the laws of its being, are occasionally to be observed among other classes of animals. For instance, a tadpole may turn to a frog, and even a poor half-starved doctor, or apothecary, after a combat with the pressure of circumstances, has been known to gradually assume the *status empiricis*, but it has been only quite lately discovered that a regular medical professor, with all the collateral titular insignia of professional importance, is capable of sudden transformation into a full grown quack, amply provided with the material for generating and the organism for disseminating those *gasco-literary* exhalations so peculiar to the latter individual. Such changes among the lower animals are generally progressive; the unsightly grub, and the uncouth tadpole, becoming the beautiful butterfly, and the active symmetrical frog; but in the case of the professor, the movement is decidedly retrogressive, probably from the fact that the change is abnormal.

The true cause of this remarkable phenomenon is not generally known. Some have supposed it a case, *sui generis*, never before described; others regard it as arising from a diseased condition of the lateral portions of the cerebrum; whilst a third class of investigators deny that any metamorphosis occurred, and consider that there is nothing remarkable in the case, except the obliquity of vision in public perception, which so long caused a quack to be mistaken for a true professional man.

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NEW MEDICAL JOURNALS.—If the cultivation of Medical Science is commensurate with the number and increase of Medical periodicals in the United States, it must be flourishing. Within the past twelve months new comers have from time to time presented themselves in our mail box, some of which are the following.

The Peninsular Journal of Medicine and the Collateral Sciences. Edited by E. Andrews, M. D., Ann Arbor, Michigan—monthly.

The Medical Reporter, a Quarterly Journal, published under the direction

of the Chester and Delaware County Medical Societies. Published at Westchester Pennsylvania.

The Memphis Medical Recorder, published bi-monthly by the Memphis Medical College. Edited by A. P. Merrill, M. D. and C. T. Quintard, M. D. Memphis, Tenn.

The American Medical Monthly, conducted by Dr. Horace Green, E. H. Davis, B. Foredyce Barber, R. O. Doremus, J. M'Carochan, E. R. Peaslee, and E. H. Parker; the last named being Editor. Published at New York.

The Medical Chronicle, or Montreal Monthly Journal of Medicine and Surgery. Edited by Drs. Wm. Wright and D. C. MacCallum, Montreal, Canada East.

The People's Medical Gazette. Edited by John Davis, M. D. Abbeville Court House, South Carolina.

The Iowa Medical Journal. Conducted by the Faculty of the medical department of Iowa University. Published monthly at Keokuk, Iowa.

These like most of the Medical Journals are generally so occupied by subjects strictly medical, and present so few papers suitable for transfer to a Pharmaceutical Journal, that the advantage of an exchange is very slight. Those Journals therefore who do not receive our Journal in exchange, will please to understand that our list of Medical exchanges is already greater than is profitable, and that in declining to reciprocate it is from no ill feeling or lack of good wishes for the success of our medical sisters.

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The Report of the Twenty-third Exhibition of American Manufactures, held under the auspices of the Franklin Institute of Pennsylvania, has been received. It occupies fifty-eight pages, including the interesting address of George Harding, Esq., at the close of the Exhibition. The useful Institution from which this Report emanates deserves the support of every well-wisher of American arts and manufactures.

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TULLY'S MATERIA MEDICA.—The ninth number of this original work has been received. It relates chiefly to the class of remedies called "Antiphlogistica," by the author, and commences the class "Nausiatica." The "Proëm" to the class "Antiphlogistica," on the nomenclature of organic compounds, is so peculiar, that we propose, in our next number, to make some extracts from it, which we are prevented from doing now by want of space. We hope Dr. Tully will complete his work, and give the profession the results of his numerous observations, more particularly those on the vegetable Materia Medica of the United States; yet we regret that he finds it necessary to obscure his ideas, by clothing them in such complex, not to say uncouth nomenclature, that his readers find it difficult to get at his meaning without a constant stretch of the memory.

*Ellis' Medical Formulary. Tenth Edition, revised and much extended.* By ROBERT P. THOMAS, M. D., Professor of Materia Medica in the Philadelphia College of Pharmacy. Philadelphia. Blanchard & Lea. 1824. pp. 296. Octavo.

A formulary which has passed through *ten* editions must be possessed of much merit. Works of this kind should be comprehensive, without being clogged with too many useless recipes; they should be written in a clear language to avoid misconstruction; and, above all, should be free from errors in doses, names, or quantity symbols. After an examination of the new matter, and the alterations, we believe the reputation of the work, built up by the author, and the late distinguished editor, will continue to flourish under the auspices of the present editor, who has the industry, and accuracy, and we should say conscientiousness, requisite for the responsible task.

The table of doses has been re-written, and the editor openly assumes the responsibility of its correctness. Very properly, the nomenclature, which, previously, in many instances, partook too much of foreign pharmacopœias, has now been made to accord, when possible, with the simple language of our own code; which will, we hope, conduce to greater uniformity in prescription writing.

The new matter has extended the book more than forty pages. It includes additions to every chapter; many old formula have been amended, and, in introducing the new, the editor has aimed at selecting the best of their kind. Although the limits intended by the publisher were overstepped by the additions made, there are a number of preparations that might have found a place, among which may be mentioned, The Fluid Extracts of Cinchona, Buchu, Taraxacum, Valerian, and Sarsaparilla, Elixir of Opium, Glycerin, Cucumber and Carrot Ointments, Emulsion of Phosphuretted Oil, Acid Phosphates of Iron and Lime, Preparations of Caffein, Ergotin, Iodide of Iron Pills, Lactate of Iron, Resin of Jalap, and of Scammony, etc.

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*Exploration of the Valley of the Amazon; made under the direction of the Navy Department.* By WM. LEWIS HERNDON and LARDNER GIBBON, Lieutenants U. S. Navy. Part I, by Lieut. Herndon, Washington, 1853. pp. 414. (Document, Senate, Thirty-second Congress, Second Session.) With an Atlas.

On the 21st of May, 1851, Lieutenants W. L. Herndon and Lardner Gibbon, under directions of the Navy Department of the United States, left Lima to cross the Andes to the head navigable waters of the chief tributaries of the Amazon, with instructions to embark at the commencement of canoe navigation and proceed to the main trunk of that great river, and by it to Para near its mouth in the Atlantic ocean. The object of the expedition was "to enable the Government to form a proper estimate of the degree of importance, present and prospective, of the free navigation of the Amazon" to this country. In view of this aim Lieut. Herndon was directed to make

inquiries relative to the present condition of the silver mines of Peru, and to the probable influence that the free navigation of the Amazon and its tributaries would exercise upon the working of them? to what extent these rivers are navigable; and what inducements the laws of Peru and Bolivia hold out to emigrants? The character of the population, their trade and productions, the productions adapted to the climate and soil of various parts of that region, the state of tillage, the quality of the laborers, the value of labor, etc. and other information of interest to a commercial people.

After crossing the Andes to Fort San Raymon on the Chanchamayo, one of the head waters of the Ucayali,\* he determined not to descend that river on account of the hostility of the Indians, who have complete possession of that part of the Montaña, or broken country east of the Andes, but to take the Huallaga. At Tarma he parted with Lieut. Gibbon, who was directed to pass to the southward through Bolivia to the headwaters of the Marmore, and descend it and the Madeira to the Amazon, which was duly accomplished, but not till long after Herndon had passed down the latter river. The report of Mr. Gibbon when ready will constitute the second part of the Exploration. Our limits will not admit of following Herndon in his long and tedious navigation, nor of commenting on the various interesting observations he has recorded, but we will make a few extracts in reference to those productions of the Amazon Valley that interest the pharmacist and physician. The drug most extensively collected is sarsaparilla. It constitutes a sort of medium of exchange—a substitute for money. The dues to the Church are paid in sarsaparilla; the village merchant receives sarsaparilla for his wares; and speculators send expeditions up the various branches of the Amazon after this world-renowned medicine. The sarsaparilla, that from Pará, is distributed to the world by commerce, is the ingathering from an hundred river banks by thousands of petty expeditions, where collections pass from hand to hand down the long navigation of that mighty stream until it reaches Pará. Hence much of the so called “Pará or Brazilian sarsaparilla” grows thousands of miles in the interior. Lieut. Herndon says:

“Sarsaparilla is a vine of sufficient size to shoot up from the earth fifteen or twenty feet from the root without support. It then embraces the surrounding trees and spreads to a great distance. The main root sends out many tendrils, generally about two lines in diameter and five feet long. These are gathered and tied up in bundles, of about a Portuguese arroba, or thirty two pounds weight. The main root or *madre* should not be disturbed: but the Indians are little careful in this matter, and frequently cut it off, by which much sarsaparilla is destroyed. The digging up of the small roots from the wet and marshy soil is a laborious and unhealthy occupation.

“It is found on the banks of almost every tributary of the great streams of the Montana; but a great many of these are not worked on account of the savages living on their banks, who frequently attack the parties that come to gather it. The whole Southern border of the Amazon from the mouth of the Ucayali to that of the *Yavari* is inhabited by the “Mayorunas” all

\* We were in error in stating that Lieut. Herndon descended the Ucayali, in our last number—it was the Huallaga.



savages, and averse to intercourse with the white man. Above Sarayacu on the Ucayali, is the river *Aguaytia*, upon the banks of which grows sarsaparilla in sufficient quantity to enrich not only the Province of Mainas, but all the department of Amazonas. [Yet] Padre Calvo, the president of the Missions at Sarayacu told Mr. Herndon, that although he has the exclusive right, by order of the prefect, of collecting all the sarsaparilla on the Ucayali and its tributaries, he could not for any price supply more than 300 arrobas [about 10,000 lbs.] annually on account of the difficulty of getting laborers who are willing to brave the attacks of the savages." p. 188.

*Manteiga* is another production of a different kind which is also largely an article of Amazonian commerce. It is the fixed oil obtained from the eggs of the turtle that inhabit the banks of the rivers, and is obtained by crushing the eggs in a canoe, exposing the emulsive mass to the sun till the oil rises to the surface, when it is skimmed off, boiled and introduced into earthen pots of 45 lbs weight. Each pot is worth \$1.30 at the beach, and \$2 to \$3 at Pará. A turtle will average eighty eggs; forty turtles will give a pot of oil; twenty five men will make 200 pots in twelve days; the beaches of the Amazon and its tributaries yield about 6000 pots annually.

*Copaiba* is another drug that, like sarsaparilla, is collected in small quantities on various branches of the main stream, and it is carried down to Pará in earthen pots to the amount of 7 or 8000 annually, from whence it enters foreign commerce in barrels. The rivers draining the country north of the Amazon, especially the Rio Negro, yield more of the copaiba than those to the South.

Among other articles which come down to Pará are annatto, cacao, tonqua beans, vegetable wax, isinglass, vanilla, sugar, copal, various valuable cabinet woods, guarana, Brazillian nutmegs and caoutchouc. The annatto plant grows spontaneously in Eastern Peru. Tonqua beans (Cumare) are found in great abundance on the upper waters of the Rio Negro. The same region is particularly productive in cacao.

The *India rubber* is produced very largely in the country bordering on the Xingu and smaller neighboring streams of which Gurupá is the *entrepot*. Our author gives a detailed account of the process of extracting the juice and converting it into the commercial caoutchouc, which we will present to our readers on a future occasion.

It may be wondered at that no notice is taken of the cinchona trees or the bark trade. The portion of country traversed by the author was not a bark region, or, unfortunately for the interests of materia medica, being neither a botanist or pharmacologist, he could not take advantage of the excellent opportunity for observation and inquiry in that direction which his official character afforded. It is to be hoped that Lieut. Gibbon, who passed through the Bolivian bark region, and who, we are informed, brought home specimens of bark, has been more medico-botanically disposed, and will give us in his forthcoming continuation of the "Exploration of the Amazon" a fund of interesting observations on the local commerce in cinchona, and the probability of diverting the current of trade in this important drug down the valley of the Madeira to an Atlantic port.



*The Elements of Materia Medica and Therapeutics.* By JONATHAN PEREIRA, M. D., F. R. S., and L. S. *Third American Edition, enlarged and improved by the Author. Including notes of most of the medicinal substances in the civilized world, and forming an Encyclopedia of Materia Medica.* Edited by JOSEPH CARSON, M. D., Professor of Materia Medica and Pharmacy in the University of Pennsylvania, &c., &c. Vol. II. Philadelphia. Blanchard & Lea. 1854. pp. 1226, octavo.

In accordance with the notice in our last number, the final volume of Pereira's *Materia Medica* has been published and is now ready for the numerous class of readers, who, like ourselves, feel interested to know what improvements the work has undergone in evolving from the scrutiny of a third edition. When the American publishers concluded to issue the first volume separately at the close of 1851, they expected to be able to complete the work in the following July or August, but owing to the delay incident to the very thorough revision to which the author was subjecting the work it had not been revised beyond the article *Cinchona* (page 700 of 2nd volume,) at the time of his lamented death in January 1853. As soon after that event as circumstances would allow, the continuation of the revision was placed in the hand of Doctors Alfred S. Taylor and George Owen Rees, whose concluding prefatory notice is dated September 1853. In our notice of the 1st volume (Jan. 1852, vol. xxiv. p. 94,) it was stated that the American publishers had made an arrangement with Dr. Pereira to revise for their press, the 1st volume of the English 3d edition published in 1849, and in furnishing the subsequent sheets, to do it in reference to the American edition. This was faithfully attended to up to his demise, he including some articles first introduced into the work by Prof. Carson in preceding editions, yet the American editor, as we shall see, has had many occasions to add notices of American drugs as in the previous editions. It is impossible in the largest space that can be allotted in this Journal to do full justice to so extensive a treatise; nevertheless, without further apology, we will endeavor to give as full an examination of its new features as possible.

The reader is aware that Dr. Pereira's basis of classification is scientific and not alphabetical. The first volume is a treatise on the chemistry and therapeutics of mineral drugs and medicines. In the second volume the the plants and animals contributing to the *Materia Medica* are treated of under their natural arrangement, commencing with the algaecious plants, and continuing through the medicinal cryptogamiæ; then commencing with the endogenous phanerogamia and proceeding through these and the more numerous classes of the exogenæ from *Cycadaceæ* to *Ranunculaceæ*; thus reversing the usual order as observed in Griffith and Lindley, of commencing with the *Ranunculous* plants and ending with the *Algaecious*. In the animal kingdom the same arrangement is adhered to—first from sponges to the *crustaceæ*—among *invertebrata*; and from fishes to *Rodentia* in the *vertebrate* division.

The article on Carrageen has grown from one to more than three pages.

In this, as in numerous instances throughout that part of the work revised by the author, he has brought the microscope to bear in elucidating the characters of drugs, especially their structure, which is often beautifully illustrated with wood cuts. Ten other species of *Chondrus* are enumerated besides *C. crispus*.

"*Chondrus mamillosus* is found in commercial carrageen. Some samples I found to be principally composed of this species. The frond of this plant is more or less channelled; but the species is best distinguished by the fructification; in *C. crispus* the subhemispherical capsules are imbedded in the disk of the frond, producing a depression on the opposite side; in *C. mamillosus* the spherical capsules are scattered over the disk of the frond, and are supported on little short stalks. (see fig. 158.)"

Fig. 158.



Dr. Pereira regards the gelatinous matter of carrageen as peculiar, although it corresponds in composition with starch and bassorin, and like those substances it is converted into soluble gum and sugar by digestion with dilute sulphuric acid.

The article on *Cetraria* has been much extended, especially as regards the chemistry and structure of the moss.

The subject of *tinctorial lichens* has been completely rewritten. The commercial varieties of orchilla weeds and mosses are referred to their proper botanical sources. *Litmus*, *orchilla liquor*, and *cudbear* are treated in detail, especially the former, upon the manufacture of which much light has been thrown since the former edition of the work. The remarks upon litmus paper are particularly good.

**FERMENTUM CERVISÆ. Yeast.** This interesting subject has been extended from one page, as an appendage to the subject *Hordeum*, to seven pages as a distinct article; illustrated by eight wood cuts. We extract the following:

"BOTANY. The substance called yeast is a mass of microscopic cryptogams. The organization and vitality of yeast are demonstrated by the *form* and *structure* of its particles as determined by the microscope; by their *chemical composition*; by their *reproductive power* as proved by the generation of yeast during the fermentation of beer; and lastly by the *effects* of mechanical injuries of heat and cold, and of chemical and other poisons."

"When submitted to microscopic examination, yeast is found to consist of globose, more or less ovoidal, ellipsoidal, or

FIG. 176.



b



a. microscopic appearance of fresh yeast.  
b. represents the gradual change in the character of yeast cells.

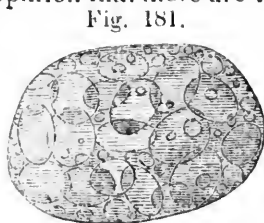
somewhat pyriform, transparent, nucleated cells, varying in size from 1-7500th to 1-2500th of an English inch. The nucleus appears to me to consist of a mass of granules or nucleoli of unequal size; some of the larger ones are highly refractive and probably contain oily or fatty matter. The nucleoli are called by Turpin, *globuline*."

"It is well known that a pure solution of sugar will not undergo fermentation when exposed to the air, but a saccharine vegetable juice which contains albuminous matter, (as the juice of the grape), suffers spontaneous fermentation, and this process always begins with the formation of yeast cells.

"By some it is assumed that these arise from yeast-germs floating in the air, and which meet with a fit receptacle for their development in the vegetable juice, germinate and grow, and effect vinous fermentation. By others their production is ascribed to a *generatio primitiva*.

"Turpin was of opinion that there are three sources or modes of production of the yeast plant:

1st, the transformation of globulin into yeast cells; 2d, budding or the separation of the joints of moniliform stems; 3d, the escape of spores (*globulins seminulifères*), from the interior of the cells. Mitscherlich admits the two latter modes of growth.



Cell from the albumen of barley containing starch spores (*globulins grains*).

*seminulifères*), from the interior of the cells. Mitscherlich admits the two latter modes of growth.

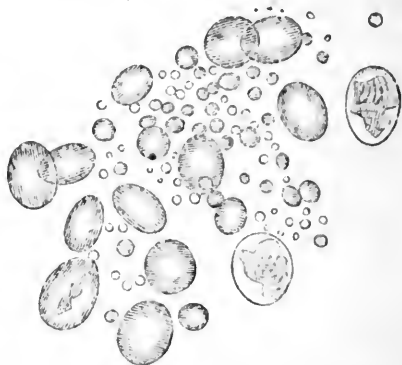
"The amylaceous particles contained in the cells of the albumen of barley (see figures 181 and 182) are called by Turpin, *globuline*. The transformation of these is, according to the same authority, the primitive origin of beer yeast. Dr. Lindley partly confirms Turpin, for he states that he has seen these smaller granules sprout during fermentation; and he adds, that they have at that time lost all their starch, for iodine produces no sensible effect on their color.

"Turpin states that 35 lbs. of dried or pressed yeast produced, during the brewing of 5700 litres [1500 gallons] of beer, 247 lbs. of dried or pressed yeast; that is an actual increase of 212 lbs. of new yeast."

Of the remaining Cryptogamiæ we will merely allude to *Lycopodium clavatum*. Even this comparatively unimportant article has received the minute attention of the author, its botany and structure investigated, and the various sophistications and adulterations exposed. Fig. 199 exhibits a magnified view of the sporules or grains of *Lycopodium clavatum*.

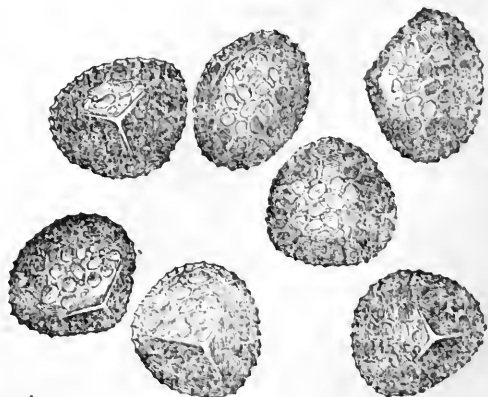
Fig. 181.

Fig. 282.



Turpin's globuline of barley.

Fig. 199



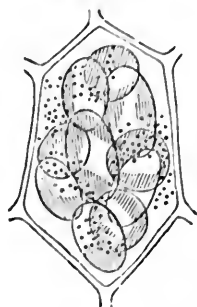
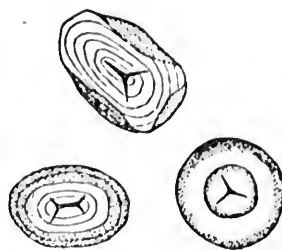
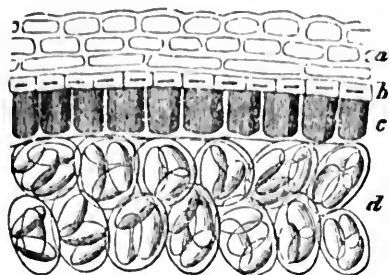
Sporules of *Lycopodium clavatum*, (highly magnified.)

The subject of Ergot although fully treated of in the previous edition has been further illustrated by comparative researches into the structure of the healthy and the spurred rye. Fig. 207 represents a thin section of a ripe

Fig. 207

Fig. 208.

Fig. 209.

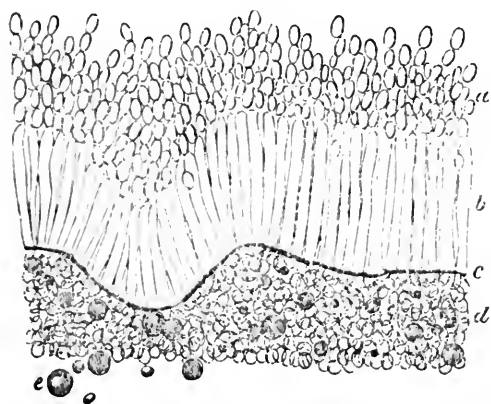


grain of rye; *a*, the seed coat; *b*, the inner seed coat; *c*, a layer of gluten cells; *d*, cells of the albumen filled with starch grains. Fig. 209 exhibits a single cell of the albumen more highly magnified, and showing the starch grains with which it is filled. Fig. 208 shows the starch grains very highly magnified.

Fig. 212.

Fig. 213.

Fig. 214.



*Microscopic appearance of Ergotized Rye highly magnified.*

Fig. 212. Thin transverse section of ergot of rye; *a*, layer of spores; *b*, sporospores or basidia; *c*, epidermis of the receptacle; *d*, body of the receptacle; *e*, oil globules.

Fig. 213. Spores of the fungus very highly magnified.

Fig. 214. Body of the receptacle with the cells containing oil.

Dr. Pereira adopts the view that ergotized rye is a diseased condition of the ovary or seed, and this condition is owing to the presence of a parasitic fungus, the *Oidium abortifaciens*. In reference to the changes induced in the structure of the seed by this parasite, he remarks:

“When examined by the microscope, we find that ergot consists of three distinct parts:—1st. The *internal part* or *body* of the ergot; this is composed of the hexagonal or rounded cellular tissue. The cells have the shape and regularity of the normal cells of the albumen, but they are considerably smaller, (Corda says they are only 1-35th of the size,) and contain instead of starch, from one to three globules of oil which are lighter than water and soluble in ether, (fig. 212 *d* and 214). 2d. The violet or blackish coat of

the ergot: this consists of a layer of longitudinally elongated delicate cells, (See fig. 212 c.) 3d. The *bloom*, which to a greater or less extent covers the violet coat of the ergot; it resembles the bloom of plums and may be readily wiped off. According to the late Mr. Queckett it consists of the sporidia of the *Oidium abortifaciens*, but Corda describes it as consisting of two parts; a layer of cylindrical undivided cells (*spores* or *basidia*, fig. 212 b.) Supporting the spores, (figs. 212 and 213.)

The article on sugar has been increased, particularly in reference to the manufacture, optical properties and chemistry of this substance. The botanical history of aloes has been revised. The observations of Messrs. Smith on aloin are merely mentioned. The paper of Dr. Pereira on socotrine aloe juice corroborating the observation of Messrs. Smith, was published too late for notice in his work. Squill is referred to *Urginea scilla*. The calcareous crystals in squill are called *phosphate* or *oxalate* of lime. M. Tilloy has recently ascertained them to be the *citrate* of that base. *Tous les mois* is referred to *Canna edulis*, and a figure of the wheel rasp used at St. Kitts in its manufacture is appended to the article. Curcuma is illustrated with eight new wood cuts. The subject of cardamoms, a favorite one with the author, has grown from ten to seventeen pages. The new matter relates to grains of paradise, Java cardamoms, Korarima cardamoms, and several other amomums, and a new figure of the *Elettaria major* or Ceylon cardamom is introduced. The history of vanilla is more fully made out than we have elsewhere seen it. Five species of the plant are described, and eight commercial varieties noticed.

The sarsaparillas have been revised with great care, more especially their botanical history, and structure as developed by the microscope. Brazilian sarsaparilla is referred to *Smilax Papyracea* instead of *Syphilitica*. Mr. Bentley\* attributes the Gautamala sarsaparilla to this species also. Dr. Pereira has attempted to illustrate the commercial varieties with wood cuts, and has succeeded much better than we would have supposed.

In regard to the starch in sarsaparillas, Dr. Pereira remarks: "It is most abundant in the Caraccas, Brazillian and Honduras varieties to which it gives their mealy character. According to Schleiden it exists in two forms—as grains and as paste. The starch grains are arranged in groups of 2, 3, 4, or 6; their shapes being modified by their mutual compression; their prevailing form being that of a mullar. Their average length is about 1-2000th of an inch. The nucleus or central cavity is scarcely perceptible by ordinary light, but by the aid of polarized light its position may be determined, as it is at the junction of the arms of the cross."

"*Starch paste* or *amorphous starch* is found in some of the cortical cells. It is more abundant in Vera Cruz sarsaparilla which is sun dried, than in the Brazillian sort which has been dried by exposure to the smoke of fires; hence probably, its formation depends on the season and not on the action of heat on the starch grain. Iodine colors it blue."

The account of the turpentine has been further extended, and especially in relation to the chemical and optical properties of the volatile oil. Dr. Pereira on several occasions explains the process of applying the phenomena

\* Pharm. Journal, xii. 470.

of *circular polarization* to the detection or determination of substances. When ordinary light is reflected at a certain angle from a glass mirror its nature is changed and it becomes *polarized*. Biot and other physicists have noticed that when such an altered ray of light passes through certain transparent liquids, and a Nichols prism, a double image is seen, which is either to the right or the left of the operator. This property, due to the molecular structure of the liquids, is so constant as to have been used to detect one in the other, as for instance grape sugar syrup in cane sugar syrup. The following quotation and engravings, will exhibit the extent to which our author has carried his illustrations.

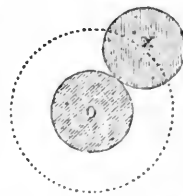
Fig. 280.

"*Plan of apparatus to show the circular polarization of oil of Turpentine.*

- a. A ray of common unpolarized light.
- b. A glass reflector placed at an angle  $56^{\circ} 45'$  for affecting the plane polarization of the light.
- c. The reflected plane-polarized ray.
- d. The oil of turpentine which effects the double refraction and rotation of the plane-polarized light.
- e. The emergent circularly-polarized light.
- f. The analyser (a double refracting rhomb of calcareous spar) which produces two colored images; one caused by ordinary refraction and called the *ordinary image*, (o,) the other by extraordinary refraction, and termed the *extraordinary image* (x.)
- g. A lens employed to produce well defined images.

When the eye is applied to the aperture above or in front of the lens g, two circular discs of colored light (fig. 281) are perceived; one (o) the ordinary; the other (x) the extraordinary. The colors of these images are complementary to each other. By rotating the analyser (f) on its axis, the extraordinary image (x) revolves around the ordinary image (o); each image undergoing a succession of changes of color; the sequence of colors being different for the English [American] and French oils of turpentine."

Fig. 281.



Under the head of salicin the singular fact is stated that salicin in its passage through the system undergoes oxidation and becomes hyduret of salicycle (oil of spirea ulmaria) in the urine, which is rendered evident by a per salt of iron producing a purple color.

Cubebæ are attributed to *Cubeba officinalis* (Miquel,) and not to *Piper cubeba*. *Cubeba canina* is also said to yield a part of the commercial drug. These plants grow wild in Java and the Moluccas.

The chemistry of castor oil does not include the recent observations of M. Bouis on the production of sebacic acid and sebacic ethers, probably because they were published too late to be noticed by the author.

Tapioca is referred to the *Manihot utilisima* of Pohl, instead of *Janipha manihot*. Dr. Pereira describes the oil of cinnamon leaves, thus :



"OLEUM CINNAMOMI FOLIORUM; *Oil of Cinnamon leaf* —It is exported from Ceylon and is sometimes called *clove oil*. I am informed by a gentleman on whose estate in Ceylon it is obtained, that it is procured by macerating the leaves in sea water, and afterwards submitting both to distillation. It is a yellow liquid, heavier than water, and has an odor and taste analogous to those of oil of cloves. Bennett declares it to be equal in aromatic pungency to the oil made from the clove at the Molucca Islands. Oil of cinnamon leaves is, however, specifically lighter than genuine oil of cloves; but like the latter it yields a dark blue color with tincture of the sesqui chloride of iron."

No notice is taken of *Aristolochia reticulata* as a source of the commercial *serpentaria* either by Dr. Pereira or Dr. Carson: this is an oversight as it is the source of a large portion of the present commercial Virginia snake root.

*Myristica fragrans* of Houttuyn is adopted as the botanical source of nutmegs and mace.

Speaking of *Banbury* or English Rhubarb, Dr. Pereira states that Mr. William Hayward, an apothecary of Banbury, was the original cultivator, about the year 1777. At present about twelve acres are under culture. The roots are removed when two or three years old, in October and November. Dr. Pereira admits that the powdered root "is extensively employed by druggists to adulterate the powder of Asiatic Rhubarb."

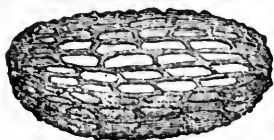
The chemistry of the Solanæ has been much amended, especially in reference to belladonna and tobacco. The article *scammony* has received many additions, yet it needs revision already as the statements of Mr. Maltass, of Smyrna (*Pharm. Jour.* xiii. 264), throw much light on its origin and mode of preparation.

The botanical source of Jalap is again changed to *Exogonium purga*. The chemistry of this drug has been revised, but the recent observations of Mayer (*Chem. Gazette*, xi. 21) are not alluded to.

St Ignatius's beans are attributed to *Ignatia amara*. In connection with the Strychnæ, Dr. Pereira describes the *S. potatorum* or *clearing nut*, the product of a large tree of Silhet. The natives prefer to drink river water after clearing it with these nuts, which is effected by rubbing the seeds for a minute or two around the inside of the earthen vessels containing the water. In a short time the impurities settle in a coagulated form to the bottom leaving the water clear and wholesome. Dr. Pereira attributes the fining property of these seeds to vegetable albumen and casein.

The gutta percha tree, *Isonandra gutta* of Hooker, is described and figured. Kawallier's analysis of *uva ursi* was published before Dr. Pereira's death, (*Pharm. Jour.* xii. 190) and should have been noticed in the last volume by the Editors. The acuteness of the author has not overlooked the curious

Fig. 320.



A Seed of *Lobelia inflata*, highly magnified.

structure of the seeds of *Lobelia inflata*, see fig. 320. They are about 1-33d of an inch long and 1-85th broad, with a reticulated cuticle. Mr. Curtis (*Pharm. Journal* xii. 119) considers this structure so peculiar, even when compared with other species of the genus, as to warrant its use, in medico-legal investigations, for distinguishing these seeds in cases where their use has been abused.

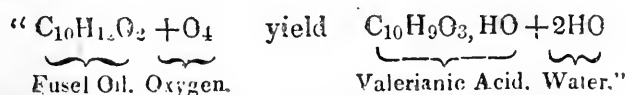


Singularly enough, *santonin*, now so well understood, is passed over without any notice beyond its name and source. It is an article of commerce in this country.

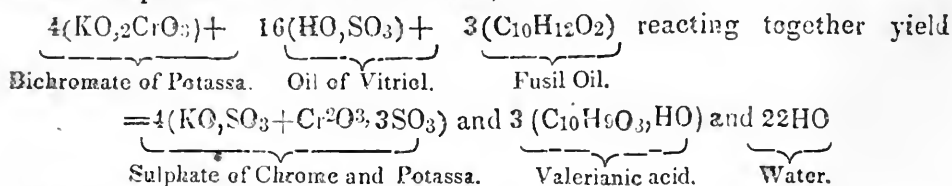
Of Carthamine, the coloring principle of safflower, Dr. Pereira says :

"From alkaline solutions it is precipitated by acetic or citric acid. In the moist state it is imported and sold under the name of *Extract of Safflower*. Spread on saucers and dried it constitutes the pink saucers sold in shops for dyeing silk. The color which it yields is beautiful, but fugitive. Dried and mixed with tale, carthamine constitutes *rouge* which is used as a cosmetic. Chinese *card-rouge* in a small folded card covered with a thin film of the coloring matter of the safflower, which in this dried state has a golden green metallic brilliancy, but which, when moistened, communicates a beautiful tint. Thin films of carthamine have a golden green metallic brilliancy, like the elytra of cantharides."

Taraxacum is referred to *Taraxacum Officinale* of Wiggers. The official salts of valerianic acid are treated of under the head of Valerian. These are all derived from valerianate of soda, the acid of which is obtained, according to the Dublin Pharm., by oxidizing fusel oil with a mixture of bichromate of potassa and sulphuric acid. Dr. Pereira gives the following rationale of the reactions:



Every equivalent of bichromate yields three equivalents of oxygen; hence it would appear that the reaction takes place between three equivalents of fusel oil, and four equivalents of the chrome salt, with the production of three equivalents of valerianic acid, thus :



In the article *Ipecacuanha* the remarks relative to the locality of the root have not been changed since the second edition, which refers the supplies of commerce to the eastern provinces of Brazil, whilst Weddell states that present commerce is chiefly supplied from the great central province of Matto Grosso. According to Castelnau this province supplied 800,000 lbs. of the drug from 1830 to 1837, all of which was transported to Rio, 1200 miles, on mule back, (Maury's Letters on the Amazon.)

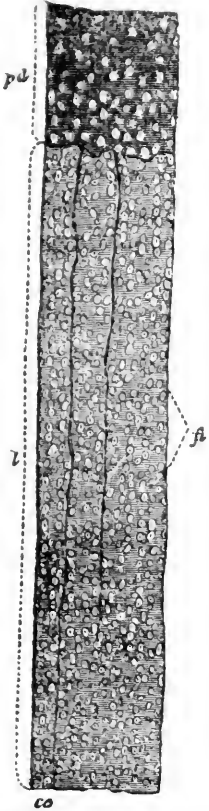
In the article on Coffee no process is given for preparing caffeine.

We now come to Cinchona, a subject upon which Dr. Pereira has lavished his best exertions with an unsparing hand. The Botany of the Cinchonas has been re-written in view of Weddell's researches. The structure of the barks, as developed by the microscope, has been illustrated by a series of excellent wood cuts, by which Weddell's idea of structural classification is explained. We quote the following in reference to calisaya bark.

"If we examine by a microscope a transverse section of this bark (see figs.

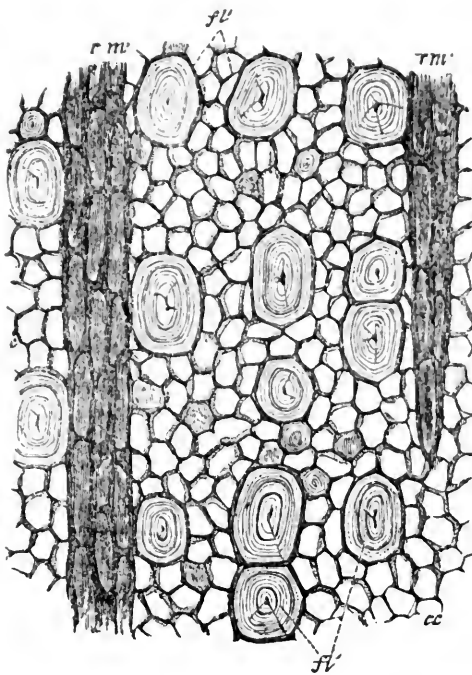
338 and 339) we observe that the texture is homogeneous, and consists of ligneous fibres uniformly distributed in cellular tissue filled with resinous matter. This tissue is interposed between the fibres so as almost to isolate them. If we examine a longitudinal section of the liber (see fig. 340) it will be seen that the ligneous fibres are short and fusiform, and their obliquely truncated extremities are only loosely adherent to, or are even completely independent of those next to them."

Fig. 338.



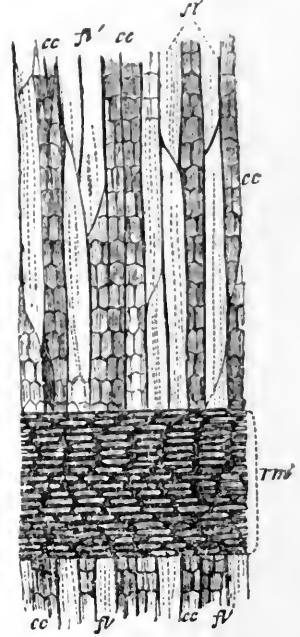
Transverse section of entire thickness of a piece of bark with a portion of the periderm attached.

Fig. 339.



Transverse section of a portion of the liber (much more highly magnified than in fig. 338.)

Fig. 340.



Longitudinal section of a portion of the liber made parallel to the medullary rays.

#### Microscopic Structure of *Calisaya* Barks.

pd. Portion of the periderm.

l. Liber.

cc. Cellular tissue.

fl. Ligneous fibres of the liber (cortical fibres.)

rm. Medullary rays.

Under the general name *Pseudo-Calisaya* barks, Dr. Pereira includes the barks of *Cinchona Calisaya*, var. *Josephinia*, *C. Boliviana*, *C. ovata*, var. *rufinervis*, *C. micrantha*, *C. scrobiculata*, and *C. amygdalifolia*.

The other barks are arranged under eleven distinct heads, viz:

2. Cortex *Cinchonæ* de Carabaya. 3. Cortex *Cinchonæ* de Cusco. 4. Cortex *Cinchonæ* de Huanuco. 5. *Cinchona Huamiliæ*. 6. Cortex *Cinchonæ* de

Jaen. 7. Cortex Cinchonæ de Loxa. 8. Cortex Cinchonæ Rubræ. 9. Cortex Cinchonæ Condamineæ Pitayensis. 10. Cortex Cinchonæ Lancifolia. 11. Cortex Cinchonæ Duræ de Carthagene. 12. Cortex Cinchonæ de Maracaibo.

The four last named are the barks of New Granada, and the 9th and 10th are respectively the *pitaya* and *coquetta*, so much in vogue as substitutes for Bolivian bark in the manufacture of quinine. The *pitaya* bark brought to the United States, varies considerably in character and value, but two distinct varieties are distinguished as *hard* and *soft pitaya*. They are generally collected in the neighborhood of Popayan, and come *via* Honda and the Magdalena river, to the coast. The former is the "Pitaya Condaminea bark" of Pereira, and as usually seen is much broken up, apparently with the view of facilitating the packing. Our author remarks:

"This bark is rich in alkaloids and serves for the manufacture of di-sulphate of quinine. It contains cinchonine quinidine and quinine. From one kilogramme (or 1,000 grammes) of this bark, M. Guibourt obtained 23 grammes of crystallized cinchonine and  $11\frac{1}{2}$  grammes of the sulphate of quinine; showing that it is one of the richest cinchona barks." "If the observations of Mr. Howard and myself as to the identity of Guibourt's *brown Carthagæna bark*, and the *Pitaya Carthagæna bark*, be correct, it follows that this is the bark which Pelletier and Caventou analyzed under the name of Quinquina Carthagæna, and which they found to contain both quinine and cinchonine, and to be perfectly analogous in composition to red bark."

"Chemical analysis proves that, in a medical point of view, the Pitaya Condaminea bark is one of the most valuable cinchona barks."

Many specimens of this variety have yielded more favorable results than those of Guibourt, as regards the quinia salt, to Mr. William Weightman of Philadelphia.

In reference to the Lancifolia bark of Bogota, Dr. Pereira observes:

"Within the last few years it has again been introduced into commerce by M. Lopez of Bogota, as a source of quinine, under the name of *Coquetta* (*Caqueta*?) bark, and the high price of Calisaya has induced manufacturers to employ Coquetta bark in the manufacture of the di-sulphate quinine."

This bark under the names of Fusugasuya and Coqueta bark has also been employed in Philadelphia as a source of quinine. Dr. Pereira gives a series of results with this bark made by Howard & Hindsley, in which it is made to yield from 32 to 112 grains of crystallized sulphate of quinia per lb. of 7,000 grains. As a general rule the results on a large scale are more favorable than in test experiments, yet various specimens of it have yielded in experimental trials made in Philadelphia 63, 91, 112, 119, and 133 grains of sulphate of quinia, per lb. of 7000 grains.

Dr. Pereira has very thoroughly illustrated the chemistry of Cinchona. He adopts the view that the ordinary sulphates of quinia and cinchona are neutral salts, and not *di*-salts, as usually considered, thus making the soluble sulphates, *bi*-sulphates; and adopts Laurent's formulæ, viz.,  $C_{33}H_{22}N_2O_4$  for quinia, and  $C_{38}H_{22}N_2O_2$  for cinchona. For Quinidinia he takes Leer's numbers,  $C_{36}H_{22}N_2O_2$ . Dr. Pereira makes no allusion to the beautiful salt of Herapath, the iodo-sulphate of quinia, nor to its

applicability as a test for quinia. Dr. Herapath's observations were published a year before Dr. P.'s death, and afford a most conclusive test of the presence of quinia. The additions to the subject of Cinchona has extended the article from 39 to 64 pages.

We have now passed over that part of the work revised by the author, and in noticing the succeeding portion we have to deal with the English editors. After having carefully gone over the latter part and compared it with the American edition of 1843, we feel more sensibly the great loss sustained by this branch of medical literature in the death of Dr. Pereira. Indefatigable in his researches, accurate in his observations, and ingenious in his conclusions, he brought all his genius to bear in the perfecting of his work. It was not to be expected, that comparatively untried hands could seize the spirit of the departed, and guide the process of revision in all its avenues of botanical, chemical, pharmaceutical, physiological and therapeutical research; much less bring to light and use the numerous results of reflection and experiment which had accumulated, and lay dormant, in the mind of the author, ready to be called out and interwoven with the text, as article after article evolved from the press; yet we cannot but feel disappointed, that the materials stored up in the Journals should not have been more thoroughly rendered subservient to the task they assumed. They appear to have, in a great measure, refrained from modifying the text, lest they should mar rather than mend it. In justice to themselves, they should have added in foot notes what they declined to incorporate in the text, if this motive urged them.

The interesting and useful comparative results of Orfila with conia, (Pharm. Jour. xi. 89,) made during his investigation of nicotina, which we believe are the best yet published, on the distinctive characteristics and properties of conia, have not been noticed.

Colocynth is referred to *Citullus*, and Elaterium to *Ecballium officinarum*. No notice is taken of Mr. Bell's paper on the cultivation of the Elaterium plant, and the process practically employed. The Editors do not notice the isolation of the benzule in speaking of oil of bitter almonds.

The article on wild cherry bark is from the pen of Dr. Carson, though not so marked. Immediately following this, hydrocyanic acid is brought in. It is probable, had the author lived to continue his labor, it would have been introduced here. In the preface to the first volume, Dr. Pereira, after stating the general plan of the work, which places the organic substances in the second volume, excepting certain salts of organic acids with neutral bases which are more conveniently treated under their bases, says, "The only exception to this mode of proceeding, will be found in the case of the Cyanides, the account of which will follow that of hydrocyanic acid, as their medicinal properties are for the most part derived from the cyanogen they contain." With this clear indication of the author's intent, it is surprising that the Editors have omitted all notice of this class of bodies, save a short notice of the cyanides of mercury, silver, gold, and zinc, in the appendix, and a foot note (at page 779) on Ferrocyanide of Potassium. Prussian blue

and cyanide of potassium are entirely overlooked. It is probable that the Editors accidentally omitted to notice them in their proper place, and subsequently forgot to put them, with other cyanogen compounds, in the appendix. This should have been corrected in the American edition. Leibig's test for hydrocyanic acid has been introduced by the Editors.

Wherever Dr. Pereira has written on a subject the Editors have generally availed themselves of it, and in some instances have quoted almost bodily. The article on Kosso is an instance of this kind. Kosso

Fig. 360.

*Brayera anthelmintica*, Kunth.

A, flowering branch.

B, bunch of female flowers.

C, flower seen laterally.

D, female flower.

a, b, c, d, e, the five outer segments of the calyx.

is the product of *Brayera anthelmintica*, a rosaceous tree of Abyssinia, attaining the height of 20 feet. Figure 360 represents a flowering branch. The flowers are diœcious, small, greenish, and becoming purple. The flowers

are the medicinal portion, and have attained much celebrity as a remedy for tape worm. The exorbitant price at which the remedy is sold, has proved a drawback to its employment.

In the article on Balsam of Peru, the Editors appear to have overlooked the researches of Dr. Pereira, published in the Pharmaceutical Journal, on the botanical source and mode of preparation of this drug, and on *white balsam and balsamito*. The Editors give no notice of these, nor of Dr. Stenhouse's investigation of the white balsam resulting in the isolation of *Myroxocarpine*. Dr. Royle, in his last edition, has very appropriately named the Peruvian balsam tree described by the author, *Myrospermum Pereiræ*, which it is to be hoped will be sanctioned.

The article on Catechu is a simple transcript of the old edition; the chemistry of catechu-tannic acid, is not brought up to the present state of knowledge. The sennas are arranged under *Cassia Officinalis*. Para Copaiba is attributed to *Copaifera multijuga* by Dr. Pereira. According to Lieut. Herndon, (Explor. Amazon,) Copaiba is collected on many branches of the Amazon, Rio Negro and Madeira, far inland, by the Indians, and is carried down to Para in earthen jars. It is, under these circumstances, very problematical whether a single species yields this variety of the drug.

The observations of Redwood, Guibourt and others, on the testing copaiba, have not been noticed.

The chemistry of Guaiacum resin has not been amended to accord with the observations of Sobrero, Deville and others, which have been recorded in recent standard works on chemistry.

In the article on ether, the tabular arrangements of Dr. Pereira for illustrating the reactions in the ether process, have been omitted, and the Edinburgh name, "Ether Sulphuricus," placed at the head of the article, instead of the new London name, *Æther*, which should have been put there.

Frankland's discovery of *ethyle* is noticed. The other derivatives of alcohol, nitric, muratic, and acetic ethers, chloroform, and acetic acid, are described immediately after alcohol, and these are followed by citric tartaric and oxalic acids, creosote, petroleum, amber, and Dippel's animal oil; all arranged under the general head of "Organic Substances," precisely as in the 1st volume of the second edition. Whether this was intended by the author or not, the arrangement is very obnoxious to criticism. Alcohol (and its derivatives) in a scientific arrangement, should have been treated after sugar, from which it is derived; citric acid under lemons; tartaric acid, with wine after the grape; creasote, petroleum, and amber, after the turpentine, with tar; and Dippel's animal oil, after gelatin in the last division of the work. This plan would have placed alcohol, the ethers, and acetic acid, and the remarks on tinctures, in the fore part of the volume, preliminary to the description of the numerous preparations and processes in which they are employed as menstrua.

The word chloroform is not found in the previous editions of the work;



hence the article under this head is by the editors, who give to our countryman, Mr. Guthrie, due credit for the first notice of this substance in an impure form. The process of inhalation is described, and Dr. Snow's inhaler figured *in situ*. This article, on chloroform, in relation to its pharmaceutical chemistry, is very deficient. It merely transcribes the formulæ of the London and Dublin pharmacopœias without comment, gives a meagre account of its properties, and hardly notices the impurities incident to imperfect manufacture. Even Dr. Pereira's paper on "decomposed chloroform," and the remarks of Dr. Gregory, Mr. Abraham, Mr. Huskisson, and Mr. Pemberton, all published or copied into the *Pharmaceutical Journal*, are passed over unnoticed.

Acetone is not treated of as a pharmaceutical product; no mention is made of Gerhardt's anhydrous acetic acid; nor is carbolic acid alluded to in connection with creosote, although it is known that the creosote from coal tar consists chiefly of this substance.

The bitter orange is referred to *Citrus bigaradia*. The recent papers of De Vrise and Hooker on the botany and commercial history of Sumatra camphor have not been noticed. Dr. Pereira's article on cotton is transcribed from the 2d edition without the mention of the words *pyroxylin* and *collodion*, nor would this last important preparation have been noticed but for the American editor, who has given a brief account of it.

We now come to the important subject of opium. The additions to this article consist chiefly in copious extracts from a paper by Dr. Eatwell (*Phar. Jour.* xi. 269 *et seq.*) on the culture of the poppy in British India, and from another, by Dr. Pereira, on the same subject. The editors have introduced Orfila's test for narcotine, and have given an account of opianic acid. They have not found it necessary to add much to the very excellent directions of the author for characterizing opium, and its more prominent principles, yet the minuteness with which the constituents of opium are treated, would have justified the editors in devoting a few lines to the *papaverina* of Merck, and the *opianin* of Herberger, two new alkaloids from opium.

In the article "*calumba*" no mention is made of the existence of the alkaloid *berberin* in it, as ascertained by Dr. Bödiker, and which is probably largely concerned in giving activity to the root; nor is allusion made to the *columba wood*, the product of *menispermum* (coseinum) *fenestratum*, which also contains *berberin* (see *Pharm. Jour.* xii. 185-189) and which is used as a sophistication of the true *columba*.

Picrotoxin is stated (on the authority of Dr. Francis) to contain nitrogen. In the article *Helleborus niger*, *helleborin*, the crystallizable substance discovered by Mr. Wm. Bastick, is not noticed.

A formula for *Fleming's tincture of aconite* is introduced by the editors, which is as follows:

"Take of the root of *Aconitum napellus*, carefully dried and finely powdered, ℥xvi. Troy. Rectified spirits ℥xvi. macerate for four days, then pack into a percolator; add rectified spirits until twenty four ounces of tincture are obtained."



No chemical formula has been given for aconitina, although this alkaloid has been investigated recently by Von Planta. (Chem. Gaz. vol. viii. 352.)

The additions to the animal substances relate to wax, isinglass, cochineal, cod-liver oil, spermaceti, castoreum, and hyraceum.

The following note on the manufacture of carmine is taken from the papers of the author.

"Carmine is prepared from *black* cochineal. A decoction of the insect in water is made. The residue is called *carmine grounds*, (used by the paper stainers.) To the decoction is added a precipitant, say bi-chloride of tin. Alum will not answer, as the color is very different. The decoction to which bi-chloride has been added is put into wash hand-basins and allowed to stand. Slowly, a deposit takes place. It adheres to the side of the vessel, and the liquid being poured off, it is dried. Artificial heat cannot be used, as it changes the color of the deposit; neither can solar light be employed for the same reason. This precipitate, when dried, is *carmine*, [the liquor is called *liquid rouge*.] It can only be made in certain states of the weather. If the weather be too hot, the liquid soon becomes sour, and the deposit is re-dissolved; flies also injure it. If carmine be not dry it is apt to become mouldy.

"The decoction from which carmine has been precipitated yields a further precipitate on the addition of more of the precipitant; but the product thus obtained is darker colored, and is sold to the color makers as "lake."

The new views of Mr. Brodie on the constitution of wax are noticed, but the more recent observations on Chinese insect wax, by Mr. Hanbury, are not; probably because they were published too late. The article on isinglass has been enlarged by several extracts from the author's papers published in the Pharm. Journal; the editors have given some remarks on *Swineburn's refined isinglass*: and on the testing of gelatin, which are concluded by the following paragraph.

"Much absurd discussion has arisen as to whether gelatin is to be regarded as a product or an educt of the tissues. It is an educt of the swimming bladder of the sturgeon, and is properly regarded by the author as a *constituent* forming from 86 to 93 per cent. of isinglass. If an educt of the air bladder of the sturgeon, it must be equally an educt of the skin of young animals, as the calf, *i. e.* it exists in the skin as such, and is not produced from the action of boiling water, any more than starch is produced from grain by a similar process. The tissue of the skin is closer than that of the air bladder; hence it requires a longer continuance of the action of water to separate the gelatin from the other principles. Acetic acid will, however, dissolve gelatin from the skin in the cold, and tannic acid (in tanning skins) combines with the gelatinous tissues in the cold, to form leather. These facts show correctly and truly that gelatin exists in the skin as an independent principle, like albumen."

Prof. Lehman (Physiolog. Chem.), who takes the opposite view, is on the absurd side. Speaking of the physiological relations of gelatin, he says:

"Haller's remark: *Dimidium corporis humani gluten est*, now requires to be modified to the assertion that *half of the solid parts of the animal body are convertible, by boiling with water, into gelatin*; for actual gelatin is not contained in the animal organism. It has been for a long time maintained that gelatin is an actual constituent of the swimming bladder of certain fishes

but even this is by no means probable," page 396, vol. I. Again: "A comparison of the analysis of pure gelatin with those of the tissues yielding it, will show us that there is no chemical difference between the two, or that at most, they only differ by a few atoms of water. Hence it appears that in the formation of gelatin, the material of the tissues only undergoes a re-arrangement of its atoms, or a metamerism, or at most that it only assimilates water, just as occurs when starch, inulin, and lichenin, are converted by prolonged boiling into dextrin or glucose."

The extensive additions to the article on cod liver oil are in the main transcribed from the author's paper in the *Pharmaceutical Journal*, detailing the analysis of De Jongh, in which *gaduin* is described, and glycerin given as a constituent. Dr. Winckler's experiments are merely alluded to as attributing the efficacy of this oil to the oxide of propyl. Now if Winckler is correct, no glycerin exists in cod liver oil, it being replaced by the oxide of propyl, which distinguishes this oil from all other fixed oils, and we think this statement deserved more comment than it has received from the Editors.

In the article on Castoreum the curious observation by Pereira, that water distilled from castor contained hyduret of salicylic, is noticed. Its presence is attributed to the salicin in the poplar and willow barks, used by the beaver as its food.

The text concludes with a notice of *Hyrax capensis*, and the excrementitious product which has been called *hyraceum*.

The inordinate length to which this review has extended admonishes us of the necessity of drawing it to a close, yet we cannot in justice do so before noticing the labors of the American Editor. When the first American edition of Pereira's *Elements* was to be published, Dr. Carson found the English edition deficient, in the omission of many important medical plants peculiar to the United States, and he introduced distinct articles to meet the deficiency. The principal of these were, *Quercus tinctoria* and *Alba*, *Chenopodium*, *Aselepias tuberosa*, *Apocynum cannabinum* and *androsæmifolium*, *Cerasus serotina*, *Gillenia trifoliata*, *Sanguinaria Canadensis*, *Magnolia glauca*, *Liriodendron tulipifera*, *Cimicifuga racemosa*, *Coptis trifoliata*, *Podophyllum peltatum*, *Juglandis cinerea*, *Geranium maculatum* and *Cornus Florida*, which are in the present American edition. In most instances they are a reprint from the previous edition except in some of the pharmaceutical preparations. In the chemistry of *Sanguinaria*, Dr. Carson makes no allusion to the researches of Sheil and Reigel on sanguinarina, (*Chem. Gaz.* vols. i. and iv.) and the analysis of *Podophyllum* by J. R. Lewis, (*Am. Jour. Pharm.* vol. xix. p. 165,) clearly proving the presence of an active resin like *jalapin*, has been overlooked. In a few instances articles previously noticed have been omitted, as *Asarum canadense*, and the *Aralias*. We think in a work professing to be "an encyclopædia of materia medica" that every indigenous drug at all in esteem should have found a place, however short the notice. Among the items either overlooked or intentionally excluded, are *Medulla Sassafras*, *Monarda punctata* and its volatile oil, *Aristolochia reticulata* as the source of much of the commercial snake root, *Cassia marilandica*, *Rhus glabrum*, *Hydrastis Canadensis*, etc.

As a general rule Dr. Carson has introduced the formulæ of the United States Pharmacopœia, but many exceptions occur. In a number of instances the language of the previous edition, based on the Pharmacopœia of 1840, has not been changed to accord with the revised code of 1850. For instance the formulæ for syrup of garlic, syrup of ginger, stramonium ointment and syrup of ipecacuanha, are those of 1840. Whilst the U. S. P. formulæ for compound resin cerate, extract of dulcamara, the infusions of capsicum, and of ginger, the extracts of the juices of stramonium, belladonna, hyoseyamus, aconite and conium, (requiring the rejection of the chlorophylle and albumen,), rosewater ointment, (cold cream,), extract of quassia and rectified oil of amber, have been entirely omitted.

The numerous formulæ of the United States Pharmacopœia to be interpolated, the urgency of the publishers to issue the work, too long delayed by the author, and the desire to keep the size of the book within reasonable limits, are circumstances which may account for many omissions both in the American and English editions; and perhaps we are apt to expect too much from Editors, whose duty, at best, involves an amount of drudgery, unmitigated by pride of authorship, known only to those who have assumed the task of revision; yet we cannot but regret, in view of the manifest inefficiency of the English Editors, that the opportunity was not seized upon to place deeply the impress of American research upon the pages of this great English masterpiece of materia medica.

In expressing candidly our opinion, of the editorial labors of Drs. Taylor, Rees, and Carson, we acknowledge no motives but a deep interest in the improvement of the literature of the Materia Medica, and sympathy for the reputation of the lamented author, who, more than any other English writer in the last two decades of years, has labored earnestly and successfully in his favorite field of knowledge; and whilst we must always regret that he did not live to put the capping stone on the structure he had erected, and was remodeling, we freely admit that the third edition of his Elements of Materia Medica, although completed under the supervision of others, is by far the most elaborate treatise in the English language, and will, while medical literature is cherished, continue a monument alike honorable to his genius, as to his learning and industry.

# THE AMERICAN JOURNAL OF PHARMACY.

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MAY, 1854.  
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## REMARKS ON THE PREPARATION OF HEAVY CALCINED MAGNESIA.

By THOMAS H. BARR, of Terre Haute, Indiana.

(An Inaugural Essay presented to the Philadelphia College of Pharmacy,  
March, 1854.)

With a view to discover if possible the best practicable method of preparing [heavy] calcined magnesia, of fine quality for use in medicine, I have made numerous experiments. They are embodied in a condensed form in the following essay.

In order to make this paper as complete as possible, I have also made quantitative analyses of three of the most popular commercial varieties of magnesia in use, and a like analysis of one of the products prepared by myself. By a comparison of the analyses, and the samples submitted, an estimate may be formed of the availability of the process.

The great desiderata to be attained in magnesia, according to the opinion of most pharmacutists and physicians, are, purity, density, and smoothness or softness to the touch, qualities which are possessed in an eminent degree, by Henry's, Husband's, and Ellis' magnesias. The processes by which these are attained, have long been the subject of speculation among chemists and pharmacutists, and partly led to the examination of the subject detailed in this paper. The processes I have employed are of four kinds, viz.:

1st. The precipitation of sulphate of magnesia by carbonated and caustic alkalies.

2d. The decomposition of the chloride of magnesium by heat.

3d. The precipitation of the chloride by carbonated and caustic alkalies.

4th. The calcination of the regular mono-carbonate of magnesia.

1st. (a.) Boiling concentrated solutions of sulphate of magnesia and carbonate of soda, were mixed, and the whole evaporated almost to dryness. More water was then added, the temperature

raised to the boiling point, transferred to a filter, and the precipitate well washed.

After drying the precipitated carbonate and calcining it at a high heat, I found the product to be free from carbonic acid, about twice the specific gravity of the ordinary magnesia of the shops, not purely white, owing to the presence of iron, and possessed of a good degree of the softness so characteristic of a fine article.

(b.) A hot concentrated solution of sulphate of magnesia was mixed with a strong solution of sesqui-carbonate of ammonia, and the precipitated carbonate treated as in the first experiment. (a.)

The product was not so heavy nor so smooth as the foregoing, and like that was discolored by iron.

(c.) A solution of Epsom salts, similar to the one above described, was treated with the officinal liquor potassæ and boiled for ten minutes, when a very dense precipitate of hydrated magnesia was the result. After being washed, which required a long time to free it from sulphate of potassa, it was dried at a moderate heat, during which it assumed a granular consistence and became hard and gritty. At a full red heat this hydrate was not decomposed and could not be rendered fine and smooth.

(d.) Hot saturated solutions of the sulphate of magnesia and carbonate of soda were mixed as in the first experiment (a), and evaporated to complete dryness, stirring frequently. Water was now added, it was raised to the boiling point and the precipitate separated on a filter and washed well with hot water. The precipitate, after being dried at a moderate temperature, was calcined at a high red heat, which was continued about two hours. A dense though somewhat harsh magnesia was obtained, not, however, entirely free from carbonic acid and oxide of iron. In order to free it from these impurities it was washed with water acidulated with a few drops of pure muriatic acid. The acid decomposed the traces of carbonates present, forming with them and the iron soluble chlorides, which were dissolved out by the water, any trace of chlorine remaining being driven off by the subsequent heating to which the magnesia was exposed. This treatment rendered the product whiter, softer and more dense, and freed it entirely from carbonic acid.

(e.) Strong solutions of sulphate of magnesia and caustic soda were mixed and treated in the same manner as (d.) On attempt-

ing to dry the precipitate it fell into granules, very hard and gritty, which could not be reduced even by long trituration to a fine condition.

(f.) Having experienced much difficulty in the experiments with Epsom salts, on account of the iron which it contained contaminating the products of its decomposition, I tried in the last process, (e), to free it from that impurity by the following method. I first made a boiling hot solution of sulphate of magnesia, to which was added a sufficient quantity of carbonate of soda to form a small amount of carbonate of magnesia, expecting that the iron would go down with the precipitate and thus be separated, which, however, was but partially the case.

#### *Second Series of Experiments.*

Being dissatisfied with the results obtained from the foregoing experiments, I determined to try the feasibility of producing a magnesia of good quality by the decomposition of chloride of magnesium by heat. The following quantities I found convenient to operate upon:

Take of Hydrochloric acid, (of commerce,) two pints.

Nitric acid, a fluid ounce.

Water, half a pint.

Carbonate of magnesia, a sufficient quantity.

Mix the hydrochloric acid and water together and saturate the dilute acid thus formed with the carbonate of magnesia. Put the solution in a capsule of porcelain over a slow fire, and when it approaches the boiling point add the nitric acid, and boil the whole for ten minutes. An excess of carbonate of magnesia in powder is then to be added to completely neutralize the nitric acid. The solution is to be boiled a few minutes longer and then filtered. After filtering return the liquid to the vessel and evaporate with a gentle heat to complete dryness. When the evaporation is completed remove the mass from the capsule, and having reduced it to small fragments, place them in a Hessian crucible well glazed inside. Expose the crucible with its contents to a moderate heat, which gradually increase to a dull red. Continue the application of the heat for three hours or until the decomposition is complete.

This process, which was repeated several times, and varied in some of its details, furnished the specimens herewith presented

marked No. 6, 7, and 8. The former of these, as mentioned hereafter, is the best product I have succeeded in preparing, and is offered as approaching in fineness, softness and specific gravity, to the best article of heavy calcined magnesia manufactured.

### *Third Series of Experiments.*

(a.) Precipitated a solution of chloride of magnesium with caustic soda. The precipitate while wet and in the recent condition, was very soft and beautiful; but on drying, it assumed the granulated and rough appearance spoken of in another place as pertaining to the hydrate.

(b.) Strong solutions of chloride of magnesium and carbonate of soda were mixed together. The precipitated carbonate was well washed, and after being partially dried, was introduced into a crucible, and calcined till free from carbonic acid. The produce was of a fine white color, and entirely free from harshness. The density of this article, however, was but little more than that of the ordinary commercial variety.

Wishing to ascertain the effect of water on magnesia, in modifying its density and smoothness, I passed steam into a bottle containing the result of the above process until about ten per cent. was absorbed. This rendered it much more dense; but impaired in some degree its original softness.

### *Fourth Experiment.*

It having been suggested to me by a friend, that perhaps a good quality of magnesia could be made by calcining the regular monocarbonate of magnesia (often, though improperly called the bicarbonate) I determined to try the experiment, and proceeded in the following manner: Dissolved the carbonate of magnesia of the shops (which is a subcarbonate) in an aqueous solution of carbonic acid  $\text{HO}, \text{CO}_2$ . Exposed the solution in a shallow vessel for a few days, that the excess of  $\text{CO}_2$  might escape, when the salt was deposited in small crystals. These were dried and calcined, yielding a very inferior article, which was very light, adhering and caking under a slight pressure, and requiring long calcination to free it entirely from carbonic acid.

### *Remarks.*

I propose offering a few remarks on some of the foregoing pro-



cesses and products, which may aid others who feel disposed to investigate the subject. A pure, heavy and smooth magnesia may be obtained either by precipitating a hot concentrated solution of sulphate of magnesia with a like solution of carbonate of soda, or by the decomposition of chloride of magnesium by heat.

It is difficult to say which of these processes is on the whole preferable. The difficulty of separating iron from the commercial sulphate of magnesia is an objection to the first process, but the heat in this need not be so carefully regulated as in operating upon the chloride. It has also the advantage of giving off no corrosive gas in the process of calcination. The precautions to be used in executing the formula before given, in which the chloride is prepared from commercial muriatic acid and carbonate of magnesia, and afterwards decomposed by heat, pertain mainly to the separation of iron and the regulation of the heat.

As commercial muriatic acid always contains more or less iron, it is important to find the best and cheapest method of freeing it from that impurity without resorting to the process of redistillation.

The nitric acid, which in the formula is directed to be added to the solution of chloride of magnesium, answers the purpose admirably. The acid acts by peroxidizing the iron, which is almost entirely precipitated and separated by neutralizing the nitric acid with an excess of carbonate of magnesia, and then filtering the solution, during which it will often be necessary to add a little water to prevent its congealing. During the evaporation, the fire must be under the complete control of the operator, or the vessel of such capacity as to hold considerably more than he is operating upon, for without this precaution the solution, as it becomes concentrated, will froth up so as to be spirted out of the capsule.

Towards the close of the evaporation, and as the chloride becomes more and more decomposed, it sinks to the bottom of the capsule in the form of a hard cake of subchloride, from which, as the decomposition proceeds, the chlorine escapes through minute holes, which give the mass somewhat the appearance of a honey comb.

In regard to the intensity and duration of the heat in the calcination, I have come to the conclusion, after many trials, that a low heat, just approaching to redness and long continued, will en-

sure a much finer product, than the sudden application of a high heat for a short time.

The above fact will appear much clearer on an examination of one of the specimens presented—No. 9. This sample bid fair at the beginning of the process to be of superior quality, but the crucible containing the subchloride was placed in a strong air furnace and raised quickly to a white heat, which was continued three hours. After the fire had cooled down, the contents of the crucible was removed, and very much to my surprise and disappointment, found to be in a hard semifused mass of a cellular form, and colored with iron derived from the crucible.

It is a difficult matter to procure crucibles that combine all the requisite qualities, viz., cheapness, durability, and freedom from iron or other substances easily acted on by the chlorine. I found the white Hessian crucibles, when well glazed inside, to be superior to any other kind that I could procure. I employed a small crucible of the above description in eight operations before it became useless. Berlin-ware crucibles would be the best to use, were it not for their expensiveness and liability to fracture on the sudden application or withdrawal of heat.

The specimen marked No. 7 is part of a lot that was kept at as high a heat as a German porcelain evaporating dish would bear, for eight hours, when it was found to be in a granular powder, almost free from chlorine. This powder was removed to a filter, and washed well with hot water, dried, and again exposed to heat for a short time. This treatment rendered it somewhat finer, but the crystalline condition could not be entirely overcome, even by long trituration.

The above sample is the one analyzed, and contains over 95 per cent. of pure magnesia. No. 8 is a portion of the same specimen which has not been trituated, and shows very clearly the granular condition just mentioned in connection with No. 7.

Specimen No. 6 exceeds so much in fineness and density the others, that the question naturally arises, what is the cause of so great a difference in these three samples made by the same process. In one case the crystalline character is almost entirely broken up, while in the others the very opposite results were produced. I must confess my inability to offer a satisfactory solution

of the question, but leave it with the hope that abler hands than mine will give an answer.

The fused subchloride, when freshly broken, presents a beautiful striated fracture. A dilute solution of the chloride allowed to evaporate spontaneously on a plate of glass, deposited crystals, which, in their mode of formation and general appearance, resembled those of nitrate of ammonia. They were, however, very deliquescent, and could not therefore be long preserved.

A specimen (No. 10) of hydrate of magnesia in mass, contaminated with iron, is presented with the other specimens. The results of the analyses previously referred to, of different ponderous magnesias of commerce, are here presented in tabular form. They have been made with care and attention to accuracy.

	Henry's, Sp. gr. 3.404.	Husband's, Sp. gr. 3.326.	Ellis', Sp. gr. 3.386.	T. H. Barr's Specimen, No. 7. Sp. gr. 3.442.
Magnesia, . . .	94.40	84.306	94.04	95.016
Water, . . . .	.50	11.400	.80	1.300
Silica, . . . .	.80	Trace	Trace	Trace
Iron, . . . . .	1.20	.700	.80	.400
Lime, . . . . .	.11	1.008	1.81	.404
Alumina, . . .	1.80	.500	.60	1.200
Sulph. Magnes. .	.30	.300	.50	.800
Sulph. Soda, . .	1.60	1.100	.70	.400
Chlorine, . . .			Trace.	Trace.
	100.71	99.314	99.25	99.520

There is one point in particular in the analyses to which I would like to call attention, and that is the large proportion of silica in Henry's magnesia compared with that contained in the others. The greater part of the silica in the article referred to, was left behind as a gelatinous precipitate with a little anhydrous silica. A precipitate of this kind is produced only when a silicate of some base is decomposed. It is supposed, and I think with reason, that Henry's magnesia is calcined at a very high temperature, and as magnesia will unite with silicic acid (which is contained in, almost if not all, crucibles) at a high heat, I think that this will account for the presence of that impurity in such a large proportion. The amount of silica contained in the others is a mere trace.

The amount of water found by me in Henry's and Ellis's magnesias approximates closely with that found by Prof. Procter, (see *Am. Journal of Pharmacy*, Vol. 22, page 383,) but with Husband's there is a considerable difference in the results, showing

that different specimens differ in the amount of water which they contain.

The true hydrate of magnesia contains about thirty per cent. of water, and, as I have shown in this essay, is gritty, and not a desirable article, from which it would seem that Husband's, like the ordinary English calcined, is only partially hydrated, probably by the gradual absorption of water after leaving the fire. This is rendered more probable from the known fact that caustic magnesia has a much stronger affinity for water than for carbonic acid. My attempt to improve the physical properties of a specimen by passing steam into it failed, and I have found, moreover, that Husband's magnesia is softer after being dehydrated than before, so that whatever effect water may have upon the therapeutic action of this medicine, I do not believe it is calculated to improve its softness or impalpability.

The subject of this paper has occupied as much time and attention as I can now devote to it; but I am convinced that the whole question is still worthy of careful investigation, with a view to ascertain not only the cheapest and most productive process, but also which of the products obtained are most worthy the esteem of the medical practitioner.

If, in the course of these experiments, I have elicited any new facts connected with this often mooted subject, of interest or advantage to the profession of Pharmacy, my labor will not have been in vain.

It is proper for me to state in this place, that the experiments detailed in this paper were made in the laboratory of my preceptor, Mr. Edward Parrish, and I acknowledge my obligations to him for the opportunities afforded me for prosecuting my investigations.

NOTE.—[We have examined the three specimens of magnesia, referred to at page 196, as regards their texture and appearance, in comparison with Henry's magnesia. Specimen No. 6 agrees very closely with the best heavy magnesias of commerce, yet it lacks, in a readily appreciable degree, the velvety softness of genuine Henry's or Husband's magnesia, or that of the Messrs. Ellis. As a first result it is very successful, and speaks well for the skill of Mr. Barr.—EDITOR.]

ADDRESS DELIVERED TO THE GRADUATES OF THE COLLEGE OF PHARMACY OF THE CITY OF NEW YORK, BY THE PRESIDENT, MR. GEORGE D. COGGESHALL, AT THE STATED MEETING, MARCH 16, 1854.

At the close of his address, on motion, the President was requested to furnish the Secretary with copies, to be offered for publication in the New York and in the American Journals of Pharmacy.

By order,

F. A. HEGEMAN, Secretary.

GENTLEMEN GRADUATES OF THIS COLLEGE,—

It is a pleasure to congratulate you upon the successful issue of your term of study, and we have invited you to meet with us this evening, that we may present you with the Diploma according to prescribed form. Your connexion with the College as students closes with this ceremony, and the full responsibility of accredited professional standing from this time devolves upon you. We trust that this Diploma will be so regarded by you, and that it may never suffer reproach through neglect or dereliction from duty on your part.

It is an appropriate custom, on occasions like the present, to unite with our congratulations on past success some considerations upon the duties of future professional life. And it is not only an appropriate, but a wholesome custom; for such is the relaxing influence of habit upon the mind, that it is good for us all, at successive points of our progress, to improve occasions which most naturally arrest our serious attention, and claim an earnest reconsideration of our duties in the community. Surely this, if rightly estimated, is to us a proper time for reflection, when we are giving our official sanction to practice as Pharmacutists to young men whose relation to us as students is thus closed, whose praiseworthy application to the early study of their profession gives fair promise, as we hope, of honorable distinction in the future practice of it.

The business of an Apothecary, which you are hereafter to pursue, is of a two-fold character. It is not only that of a shop-keeper, in the ordinary sense, and in which you are bound by the ordinary rules of fair dealing with your customers; it comprises also the cares, the duties, the full accountability and the prerogatives of a most important profession. "To buy and sell and get

gain," to practice your art for emolument, is certainly and justly the ultimate object of your pursuit ; let it not be, as it too often is, the first and only controlling object. Far higher considerations of duty are incumbent upon you than upon a mere tradesman. You are to assume the great trust of preparing medicines for the sick, upon which are placed their hopes of arresting disease, of restoring health, of saving life itself, or at least of alleviating so much as human remedies can, hopeless fatal suffering. If it be true that "all that a man hath will he give for his life," so far as the safety of any one of your fellow men may be entrusted to your care, it must be held sacred, first of all considerations for the time, in the discharge of your professional duties ; if emolument ensue it is well, and honestly earned ; but first of all, and paramount to all the mercenary impulses of trade, should be your duty, your professional honor. Your calling is an arduous and comparatively ill-requited one. It demands continuous study, if you would keep up with the constantly accelerating progress of science, constant watchfulness against frauds and adulterations in drugs, careful examination of the qualities of those you select for dispensing, and against their having suffered depreciation at the time you use them, that your combinations are accurately made with accurate weights and measures. In all these particulars you must be vigilant and faithful. The immediate responsibility of the medicines required by the sick rests upon you as the dependence of last resort, upon whose skill and integrity all hopes of restoration may be placed, and from whose incapacity, unfaithfulness, or error, there often may be no appeal ; it may be too late for a "correction of errors." Far removed from the sick chamber are the counting house of the importer and the warehouse of the wholesale dealer, where medicines are merchandize, the Price Current outweighs the Dispensatory ; and the anxious fear, the trembling hope with which the ultimate destination of their "goods" may be watched by sleepless eyes and aching hearts, are matters too remote to interrupt the current of trade ; yet these are the commercial sources whence you derive the crude materials upon which your art is to be employed for the immediate use of the sick. The direct responsibility, therefore, rests upon you, and neither in manner nor in part can you evade or transfer it.

Amongst the prominent objects of interest continually pre-

sented to you, continually forced upon your attention as practitioners of pharmacy, is one that is at once the reproach of medicine and the bane of society—Quackery. It is ever present and ever ready with its temptations, in opposition to the common understanding of right minded men connected with the regular professions of medicine and pharmacy, that discoveries of any means calculated to alleviate human suffering should be made generally known, that all whose province it is to prepare or apply remedies, may have the knowledge requisite for their proper manipulation and use, be enabled to suggest improvements, and to combine or separate, so as to adapt them to particular cases; and that to keep secret any useful discovery in medicine for the selfish purpose of gain, is unworthy of, and below the honorable standard of character, that every physician and pharmacist should scrupulously maintain; while the tampering with medicines by ignorant persons, and the manufacture of worthless trash under its name, are grades of depravity with which no compromise should ever be made.

The monstrous growth of quackery in modern times has, at least, kept pace with the advancement of the age in arts and sciences, designed to benefit, or, when State policy requires, more expertly to destroy the human race. It protrudes itself with the most business-like assurance into all classes and circles of society; it is ever present at the corners of the streets and in our dwellings, mixes with our daily news, buying up the easily purchasable public press, which subsists in a great measure upon it, (the only honorable exception, so far as we know, being Arthur's Home Gazette, an excellent weekly published in Philadelphia,) and it promptly makes up all deficiency of fact with brazen falsehood. History, ancient and modern, is ransacked, or even made when it is needed; current events and discussions of general interest, political, social, moral and religious, all are used as material for introductory paragraphs to the most preposterous eulogies of quack medicines. Many of these literary productions are by a class of scribblers of prose and verse, (such as it is,) who, not esteemed in any other, and probably incapable of any better employment of their talents, hire themselves to write puffs of nostrums they know nothing about. Great names are dragged into base connexion with pills, mixtures, lotions, plasters, etc., to give them currency, and fictitious ones are often substituted, as more likely to be popu-



lar, or perhaps less objectionable, than those of the real actors and recipients of the profits. Names, too, of all countries and people are appropriated whenever they can be made available. "The poor Indian" and the self-inflated Chinese are made involuntary sponsors for things as little known to them, as their language or methods of treating disease are to the nostrum makers, from whom they receive such unexpected distinction. Frightful maladies, which are providentially of rare occurrence except in these advertisements, are multiplied to suit the market, detailed with revolting minuteness, and the text illustrated with literally horrible cuts. Certificates of cures that never occurred are signed by persons that cannot be found, though their story is "told with a circumstance" of street and number, and sworn to before the Mayor or some other prominent functionary, before whom, by the way, any thing may be sworn, as he never reads it, because it matters nothing to him, yet the appendage of his name helps to pluck the great public goose. In many cases, medicines in common use are dressed in some insignificant disguise, when "presto!" what had been only simple matter of fact, becomes astonishing, and worth a great deal more in cash, whereupon, it is put up in set form with printed envelopes, showing that to bring this great discovery to the point of projection, required besides a vast expenditure of money, the whole depth of knowledge, all the skill and, through many years, the self-sacrificing devotion of the wondrous genius that has finally brought it forth, "without whose signature none can be genuine," said signature being engraved or stereotyped. New remedial agents, discovered or developed by the researches of the best minds engaged in medical science, are at once seized upon by quacks as the bases of names for new nostrums, they, forsooth, covering with the slime of their "*Compound*" the most brilliant results of learning, which from inception to promulgation would have been as far beyond the reach of their intellect as above the level of their morals. With parasite meanness, they attach themselves to the productions of men whose names will be cherished with honor and gratitude when the whole pack of charlatans are

"Forgotten as fools, or remembered as worse."

As the wares of these men are got up to entice customers, every popular prejudice must be turned to account, the most petted being one that really exists to some extent, though greatly exag-

gerated, against minerals and in favor of vegetables. Accordingly we find this string especially harped upon, a large proportion of quack medicines being named and strenuously declared to be vegetable. There are favorite vegetables also, of which the popular estimate is duly encouraged, and of all these, Sarsaparilla may be considered the "best abused" root in the Pharmacopœia. Other popular notions are treated with respect in proportion to the demand they create, and from time to time new and marvellous theories are broached, as there appears to be vacancy in the public mind for their reception. It is propounded by the pill or purging school of quacks that there is but one disease, all that are called by different names being but different forms of it, for which "Universal Pills" are obviously the very remedy. The universal school, however, comprises more than this class, whose chief mission appears to be to open men's purses by opening their bowels. There are some who do not regard the pill machine as the only instrument of human relief, there being various lights in which the one disease may be considered, according to the nostrum that is made for it; with one it is heat, with another cold, with a third both. Again it is in the stomach, the skin, the nerves or the blood. Some "Universal Vegetable Renovators" (their very name is nonsense) are applied internally, others upon the surface, but each is declared to be the only medicine that should ever be bought, that no family is safe without it or with any other, that "all others are base and dangerous impositions," the work of ignorant rogues. This latter opinion appears to be cordially reciprocated by most of the fraternity, and is perhaps the nearest truth of any they express. Other quacks denounce the universal system as unprincipled quackery, and are quite positive that none but a simpleton or impostor ever denies the existence of many diseases; they therefore condense their wisdom upon certain specialities making stories however as entire, so far as they go, as any of universal pretensions. In short, the whole system, based as it is upon the ignorance, the fears and the credulity of mankind in reference to all matters affecting health and disease, is yet so monstrous, so impudent in falsehood, that it would be ludicrous if it were not so mischievous. If its continued presence from the dark ages had not rendered it familiar, if habit had not blunted our sense of its depravity, if it could now be presented in all its deformity before a civilized community for the first time, it

would be regarded with wonder at its audacity, with execration at its reckless tampering with the best temporal interests of humanity.

We hope better things of our graduates, (though we must confess we are sometimes disappointed,) than that they should degrade their profession and deprave themselves by such prostitution of their talents and position. It is pitch that you cannot touch without being defiled. Its temptations are often great it is true, its success in one sense, and one only, sometimes astonishing; yet it often, probably in a large majority of cases, fails to secure even pecuniary success, always unsatisfying at best when gained at the cost of honor, of self respect, and the respect of the intelligent part of society, perhaps coupled with some nickname of derision; and poor indeed is he, who having staked all of principle and good repute upon such a cast, has not won even that.

Gentlemen, in the honest and honorable pursuit of your profession, you will find with many cares and much tedious labor many sources of interest that will improve and elevate your minds, the frequent association with the learned and intelligent, the respect and confidence of those who require your professional services, and the unfailing reward of duty well done. Your path will not be one of roses altogether—do not hope for it. Act faithfully and honorably as you may, your best motives will be misconstrued, your best actions misrepresented, your best efforts underrated by the weak-minded and unworthy; but the respect and confidence of the better part of those who know you, will overbalance such annoyances; and in proportion to the consciousness of doing right, is the comfort of self approval. In the practice of your profession you will find scope enough for the exercise of all the cardinal virtues, if you have them, and need enough for the cultivation of those in which you may be deficient. You must not only be scrupulously honest in what you do, you must be equally conscientious in making sure that nothing is left undone which ought to be done. You are required to be careful, as much as you are to be honest in the dispensing of medicine. You have no right to indulge in absence of mind, when the safety of a fellow creature depends upon your undivided attention, and you may be roused from such abstraction by consequences of your criminal inadvertence alike frightful and irretrievable. Your profession demands from you constant unremitting devotion to duty, duty in little things which are unknown

save to yourself, and in this consists your true virtue. It is easy enough to be great upon occasion, when public applause and silverplate are the showy rewards in prospect—men of base and selfish minds might even court opportunity for such display—but the true gold of a man's character is proved by his devotion to duty for the sake of duty, to the performance of duties unknown to others that are often tedious and burdensome, the full and faithful discharge of his duties, not because in so doing he is seen or praised or will ever be appreciated or rewarded, but from his own sense of right.

In your practice as Pharmacutists nothing can be wholly unimportant. Your course cannot be a matter of indifference to the community around you. If you are any thing in your profession, if you move at all in it, you must exert some influence, more or less, good or evil. Be ever watchful that it is good. Be great if you can, but be faithful whether or not, and if your name be not famous it will be honorable, if not spoken all over the earth, it will be a pleasant sound to your neighbors, reminding them of a trusty friend in seasons of anxiety and suffering, and synonomous in their estimation with all that designates the upright and useful man.

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#### ON RICINIS COMMUNIS.

By HENRY BOWER.

(*An Inaugural Essay, presented to the Philadelphia College of Pharmacy, March, 1854.*)

The castor oil plant (*Ricinus communis*) belongs to the natural order Euphorbiaceæ, whose affinities have not yet been accurately limited by Botanists; but it is supposed to comprise 1500 species, distributed in each quarter of the globe, from the equator to latitudes as high as Great Britain. "Sometimes found," as Professor Lindley remarks, "in the form of large trees, frequently of bushes, still more usually of diminutive weeds, and occasionally of deformed, leafless, succulent plants, resembling the cacti in their port."

The properties of this order of plants are remarkably varied, not only as regards their physical effects, which range from gentle stimulants to rank poisons, but also in those principles residing in different portions of the plant. In the *Ricinus communis* they are

found in the fruit ; and the seeds of fifteen varieties of the order, that have been examined, all, excepting one, the *Omphalia triana-dra* of St. Domingo, yielded virtues of an emeto-cathartic nature.

Some of these plants furnish properties highly valuable, on account of their medicinal uses, and first among them ranks the *Ricinus communis*, as it yields an oil that is used to an immense extent, not only in domestic practice, but is sanctioned by the medical profession as a most invaluable laxative and mild purgative.

The fleshy portion of the bean, in the analysis of Geiger, (which was the only one to be found,) is given as consisting principally of starch ; but all attempts to obtain a blue color with iodine failed. From this circumstance, and the fact of the beans forming an emulsion with cold water, it was inferred that they contained a peculiar albuminous principle analogous to that existing in almonds ; further experiment verified this. A product resembling emulsin was obtained by making an emulsion of the beans with water, adding to this twice its bulk of ether, and after frequent agitation allowing it to stand, when a transparent fluid separated at the bottom of the vessel ; this was separated from the supernatant ethereal mixture, and alcohol added, which threw down a precipitate white and flocculent ; this was collected upon a filter, and washed with fresh portions of alcohol, and dried under the receiver of an air-pump. This product was soluble in water, the solution reddening litmus paper, and when heated to  $212^{\circ}$  coagulated. But its most distinctive property was its producing the decomposition of amygdalin, yielding the odor of bitter almonds and hydrocyanic acid, but not in so marked a degree as the emulsin of almonds, although upon mixing the solutions, and allowing them to stand for a few days, the bitter almond odor was fully developed.

When an emulsion of the beans is made, a peculiar nauseous odor is given off, which, before the addition of the water, is not in the least perceptible in the bean ; this odor is more fully developed by maceration and distillation with water ; and with water rendered slightly alkaline by potassa, the uncondensed vapor had a most nauseating smell, producing absolute sickness of the stomach in an individual previously vomited by the seeds.

The emulsion becomes incapable of giving off this smell when

coagulated by heat, and with beans previously boiled in alcohol or dilute acids, no odor is perceptible in afterwards forming the emulsion with water, whilst ether appears to extract no principle, as, after digestion in it, they yield the odor alluded to by trituration with water.

Although, in the experiments, no volatile oil was obtained by distillation, owing possibly to the small quantity of the marc used, yet it is highly probable a principle does exist in the bean analogous to amygdalin or sulpho-sinapism, which, with water, undergoes the peculiar fermentation with the emulsin, forming a new substance of an odorous nature, as well as very acrid and poisonous.

That this acrid principle is not volatilized by heat alone, as has been for a long while the impression, was satisfactorily proven. As the cake residue, after expression, was thoroughly exhausted by ether, to free it from the oil, this was then heated for some length of time upon an iron plate, at a temperature sufficiently high to slightly roast it. Twenty grains of this taken by an individual produced the most violent emeto-cathartic effects, being vomited and purged for the space of seven or eight hours.

These experiments go far towards showing the importance of boiling the expressed oil with water, as the acrid principle being rendered volatile, is driven off, not by the mere application of heat alone, but from the fact of the presence of water in the operation.

But this process must be carefully employed, or the fat acids of the oil become materially modified, and are rendered acrid and rancid, as in that made in the West Indies, which is prepared without regard to the amount of heat used.

The chemical nature of these acids is not as yet fully understood, being still the subject of research by many eminent chemists in Europe.

Although all attempts were fruitless to isolate any decided principle of an acrid character, sufficient evidence was adduced to verify the assertion that principles do exist in the bean which are rendered both odorous and volatile by the intervention of water; and it is hoped, by future experiment upon this interesting subject, more definite results may be obtained.



## ON THE ADULTERATION OF DRUGS AND CHEMICAL PREPARATIONS.

By J. M. MAISCH.

There have been frequent complaints, and much has been said and written about the adulteration of drugs, and of pharmaceutical and chemical preparations, and it is obvious enough that every druggist, whether wholesaler or retailer, cannot be too careful in closely examining the articles which he buys, not merely judging from their appearance, their color, &c., as to their purity, but in testing and analyzing them so far as scientific researches will allow. Science, for some of the crude drugs, has succeeded in finding a way to ascertain to a certainty the commercial value of them; for many others we are yet compelled to rely merely on the physical properties.

It is different with chemical preparations. Here, in most instances, an analysis can be made to become satisfied in regard to the purity of such chemicals, and it is in these cases where apothecaries ought not to rely on the competency and integrity of the manufacturer or wholesale dealer. There is a possibility of a mistake occurring in labelling or unintentionally mixing two different articles of close resemblance, and it becomes the duty of the prescriptionist to be satisfied as to their purity and standard composition. Testing to detect the most common adulterations will generally answer; an experienced hand will, in most cases, then get a hint, if some extraordinary impurity be present, and find means to ascertain its nature. For the analyzer it is a matter of obligation to his professional colleagues, to put them on their guard by publishing his results, and the surest and easiest way to detect such adulterations.

Last year there was introduced into the European markets an iodide of potassium, which was of neutral reaction, and contained a very small amount of the impurities common to this preparation, in fact, it presented the appearance of an unsuspecting, almost chemically pure article. A. Erdmann (*Archiv. der Pharm.*, lxxv., page 288) found that on dissolving it in as small a quantity of water as would dissolve a certain amount of iodide of potassium, it would leave behind fragments of crystals, which required from 13 to 14 parts of cold water to dissolve them; they were insoluble



in 80 per cent. alcohol, effervesced with acids, and proved to be *bicarbonate of soda*.

*Precipitated carbonate of lime* was lately purchased of a house in this city of great respectability and integrity. It is of a very fine white color, and its particles are of a minute division; it seems to be an excellent preparation, and no doubt might be used for any of the ordinary prescriptions without finding the least fault with it. But it is soluble in a large quantity of distilled water, and does not effervesce on addition of acids. On analyzing, it was found to be *sulphate of lime*. Half an ounce (troy) of it, after exposure to a red heat, left a residue weighing 3 dr. 11 grs., loss 49 grains, or 20.833 per cent., which figure accurately corresponds with the hydrated sulphate of lime of the formula  $\text{Ca O, SO}_3 + 2\text{HO}$ . The Dispensatory of the United States says, of the precipitated carbonate of lime: "It is said to be *occasionally adulterated* with sulphate of lime." Here we have a case where the same was entirely *substituted* for it. Whether this was done accidentally or intentionally I am unable to say; but it is due to the drug house of this city to state that they did not manufacture it, and doubtless sold it depending upon the respectability of the manufacturer.

If suggestions as made above, analyzing the purchased chemicals and crude drugs as far as possible, publishing the results, if adulterations were found, and giving the best mode ascertained of detecting them; if these suggestions were carried out faithfully, I have no doubt, in a short space of time, we would have a market of drugs, and particularly of chemical preparations, much purer and less adulterated than they are sometimes met with at the present time.

*Philada.*, March, 1854.

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#### AMERICAN PHARMACY.

By EDWARD PARRISH.

(Continued from page 118.)

Having in the last number directed attention to the principal duties and responsibilities of druggists and apothecaries, and the community of interests which grows out of them, and endeavored to illustrate the advantage of a unity of purpose and action, among those engaged in these responsible and important duties, it is

the design of the present article to advert to the present position of the trade, and to some of the objects, to which its energies might be turned with advantage, reserving for a future essay some hints toward the best means of effecting a thorough and effective organization.

The natural enemy to the profession of Pharmacy is the quack. Of all the species of this parasitic genus, (some species of which infest every profession,) the most characteristic and well defined is the manufacturer of secret medicines or nostrums; depending upon ignorance and credulity for support, the medicine quack is interested in suppressing the growth of intelligence among the masses of science and a high code of honor among apothecaries and druggists. His interest would be promoted by reducing every drug store to an agency for patent medicines or a store for general merchandizing, and every Pharmaceutist to a mere salesman and shopkeeper. He would have the public draw their ideas of medical practice from the newspapers, which he has bribed into the propagation of his favorite ideas. His profound philosophy has succeeded in so simplifying this complex human organism, that all the mysteries of pathology and therapeutics vanish before his magic compound. There is no need of a *materia medica* beyond the ingredients which it contains. No need of a physician to direct or an apothecary to prepare a medicine for the diseases, which his charm can so soon dispel. This philosophy he preaches, with the zeal of a propagandist through the many-tongued newspaper press, and editors whose office is to cultivate the public mind, and to sow therein the seeds of knowledge and virtue, are, with some honorable exceptions, waked by the potent agencies behind the scenes, into strains of high encomium and unmerited praise.

What wonder then, that as a profession, dependent upon public patronage for support, we are completely prostrate; that we scarcely can, if we would, act a manly and independent part. The druggist must make a living; this is the great motive power in his, as in every other business, and in many instances, his bread and butter would fail, if eschewing all quackery he should hold up, by example and precept, a dignified testimony to his honest convictions. It is true that he may keep a tolerably clear conscience, as men can in almost any pursuit, by a sort of com-

promise between interest and duty. He may neutralize his actions with Q. S. of words, but the compound formed proves a feeble antidote to quackery, and certainly can not be labelled consistency.

That this is the position of the great majority of druggists, in regard to quackery, is well known; I believe it is mainly the result of our past neglect to avail ourselves of the advantages within our reach, and may be entirely obviated, and the profession of pharmacy raised to its true dignity and importance by uniform and well directed efforts in the future.

Druggists everywhere enjoy the most intimate relationship with the public. Acquainted by study and long familiarity with those potent agents provided by nature for the relief of pain and cure of disease, they share with the physician a peculiar and distinguished place in the confidence of those with whom they come in contact, in the line of their business. They may, to a great extent, give direction to the current of popular favor, and if possessed of the requisite knowledge and capacity to ascertain the constituents of the various nostrums they are called upon to supply, they may not only strip these of their false pretensions, but from the resources of the pharmaceutic art, may supply equally valuable standard remedies. It is, indeed, one of the duties our profession owes to the public, to supply every legitimate want, without even the apparent necessity of a recourse to the productions of the empiric.

The relations of the druggist with the physician, if properly maintained, would be found to give him an immense advantage in his warfare with quackery; so long as he pursues his calling with a just regard to the rights and interests of the medical profession and the public, and lends the weight of his influence against the common enemy, he will have the active support of all wise and liberal physicians. In strengthening the hands of these, he will be rearing for himself the strongest defence against the destructive competition of the unprincipled quack.

The intelligent and honest pharmacist, in the pursuit of his legitimate business, will always enjoy the esteem of the community, while the quack is held in disrepute by a large class of the wiser and more conservative people; success even in imposture, may draw with it the plaudits of the fickle crowd, who regard money

as a fit substitute for honest merit, but to those thinking and knowing men, whose opinions give direction to the under current of public sentiment, the thrift which follows industry combined with high and honorable principle, is a more certain passport to an honorable position, than all the wealth that can be acquired by the charlatan or quack.

Let us then, with a hopeful reliance upon the strength of our cause, labor to rescue our honorable and useful profession from the embrace which has so long choked out its vitality, and cast reproach upon its character, and in good earnest seek to infuse into it a vigorous and manly spirit, which shall result in its independence, its growth and improvement.

To this end, our first great movement must be to organize. This step, we may indulge the hope, will soon lead on to every needful reform, frequent comparison of sentiment will gradually induce a more uniform practice throughout the country, often recurring social intercourse will awaken interest in each other, and a bond of union will be developed, co-extensive with the organization; besides these social and ethical advantages, the scientific and business character which will be imparted to our intercourse, will tend to the common advantage, ideas which are capable of being individually profitable and advantageous, will become common property, the asperities of competition will be worn off, and an enlarged and liberal spirit begin to be realized, which will scorn unworthy tricks of trade, and seek the welfare of the profession at large, as well as the more selfish pursuit of individual advancement.

Without considering in detail the reforms which may prospectively grow out of an extended and thorough organization, among which the suppression of quackery stands conspicuous, it may be well to refer to some of the objects most immediately claiming the attention of those comprising the existing organizations; prominent among these is the education of the next generation of apothecaries. This object is of paramount importance in connection with the advancement of the profession and the suppression of quackery. Although a scientific education is not indispensable to success, nor even to eminence, yet it is undoubtedly an immense advantage, and experience proves that those who avail themselves of it, are generally better apotheca-

ries than those who do not. The position of the writer, enables him to come to this judgment intelligently. As an agent of the College of Pharmacy in procuring situations for its graduates and others, he has become aware of the immense advantage of its diploma to those who possess it; as a general rule it is a sufficient passport to any station in the business, which may be vacant, so that, although a diploma is perhaps sometimes overrated, yet no young man who expects to devote himself to the drug, and especially the apothecary business, should think of dispensing with so important an aid to his success.

In connection with this subject of education, the question will soon arise, how far the multiplication of Colleges of Pharmacy will conduce to the advantage of the cause. The expense to the student, residing in a distant locality, of a long journey and residence for two winters in Philadelphia or New York, in attendance on lectures, constitutes a great obstacle to the extension of this advantage. Candidates for the drug business are very often in the humble walks of life, and unable to meet so heavy a drain upon their slender resources in anticipation of any means of revenue from their business; and yet as an encouraging sign of the times, it may be mentioned that rapidly increasing numbers annually seek these advantages in Philadelphia. Against the establishment of numerous schools of Pharmacy, at present, their lie many objections, founded upon the difficulty of maintaining them as yet, and upon the almost inevitable lowering of the standard of graduation consequent upon this kind of competition; but it can hardly be doubted that in the future, should the stimulus of our national and subordinate organizations be steadily maintained, the demand for pharmaceutical education will require the services of numerous scientific teachers in different and widely separated localities.

In connection with pharmaceutical education, there are many subjects which will be found to press themselves on the attention of our organizations. The selection of suitable candidates for apprenticeship, with the requisite preliminary education; their careful training in the shop, the course of reading upon elementary science, which will be best adapted to prepare them for the College, should all be determined upon, with the best lights we can command. The establishment of preliminary schools, labora-

tories and libraries in connection with local organizations, the obligation of the employer to furnish facilities for study, and of the student to avail himself of them, will have to be so insisted upon, as to render effective the work of reform now begun. We should encourage teachers capable of giving direction to the work of education, to enter this field; let our enterprising young men aspire to impart scientific knowledge. Who is so capable of instructing the physician as well as the pharmacist in materia-medica, chemistry and pharmacy, as the well-educated apothecary? who, by his pursuits, and the tastes that grow out of them, is so peculiarly connected with those departments of knowledge which are common to a medical and pharmaceutical education? If we would reach the position to which we are entitled, we must cut loose from that vassalage to physicians, which has been too much encouraged and still keeps us down. Let us do our own teaching, and wherein we are the equals or the superiors of our medical brethren, let us not fail to assert our claims. The profession of Pharmacy lacks self-respect, and this is one reason it is not more respected by the public.

A measure fraught with a high degree of interest and importance, as calculated to promote an improved condition of our art, and to lead to an honorable emulation among its practitioners and students, has already been suggested in the American Pharmaceutical Association; it has for its object the offering of prizes for the best essays, both theoretical and practical. The subjects should be selected with a view to drawing out all degrees of scientific attainment, and a wide publicity being given to the papers in connection with their author's name, would operate as a further incentive to competition, in this very important line of effort. Those which require illustration, and which are connected with the display of apparatus and of improved processes, should be read publicly at the annual meetings, an additional charm, connected too with practical advantages, would thus be imparted to these gatherings.

The cultivation of a pharmaceutical literature among ourselves, which shall make pharmacology, instead of a secondary branch of medical knowledge, a distinct department of science pertaining to a distinct profession, is an object greatly to be desired and promoted by every legitimate effort. In connection with this, we should



not overlook the utility of diffusing among the people a knowledge of the true relations of Pharmacy. The experiment would well repay a trial, of purchasing a place in the popular newspapers wherein correct views should be diffused, as a sort of antidote to the puffs of quackery. This, of course, would require great skill and judgment; it should be done without the appearance of antagonism, without any pointed allusions, but in a manly and dignified spirit, with a direct view to diffusing a knowledge of the true nature of the healing art, and of the injurious consequences of too free and indiscriminate use of medicines. The druggist and physician, unlike the quack, have nothing to fear from the diffusion of light among the people, and I believe in this would be found our strongest weapon against quackery.

(To be continued.)

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#### PULVIS FERRI—IRON BY HYDROGEN.

By WILLIAM PROCTER, JR.

There has recently been considerable discussion in the London Pharmaceutical Journals, as to the composition of the substance, sold as Quevenne's metallic iron, and as manufactured by Mr. Morson and Mr. Heathfield, both of London. Having for several years been a manufacturer of this preparation, although not now so engaged, it may be appropriate to say a few words in relation to the subject at issue.\* It appears (Pharm. Jour. page 333, Jan. 1854,) that iron reduced by hydrogen made by both the gentlemen named, was on sale in Edinburg by different pharmacutists. Messrs. Duncan, Flockhart & Co., who sold the preparation of Mr. Morson were complained to, that their iron was not *black* like that of Mr. Robinson made by Mr. Heathfield. Messrs. D. F. & Co., then forwarded to Mr. Morson a sample of the black iron, and he pronounced it magnetic oxide of iron, and not metallic iron. On this Mr. Robinson placed samples of both kinds in the hands of Dr. George Wilson of Edinburgh, who pronounced both to be impure, that is, contained oxygen, but that Heathfield's was 7 per cent. purer than Morson's. On this being published in the *Chemist*, Mr. Morson obtained a specimen of Heathfield's iron

\* See a paper by the Author, Amer. Journ. Pharm., vol. xix. p. 11.



as sold in Edinburgh, and had it analysed by Dr. Gregory, Dr. Stenhouse, Prof. Williamson and Dr. Garrod, all of whom pronounced it to be magnetic oxide of iron, and published the whole affair in the *Pharmaceutical Journal* of January. In the next number, Mr. Heathfield pursues the subject by bringing forward microscopical evidence, and vindicates the *black* iron from the charge of impurity, attributing its color to minuteness of division, rather than to magnetic oxide, and endeavors to throw doubt on the correctness of the four analyses obtained by Mr. Morson. And finally Dr. George Wilson appears in the March number, reasserts the correctness of his analyses, and claims for specimens of the preparation of Mr. Heathfield, since examined, the strength of 91 and  $98\frac{1}{2}$  per cent. of metallic iron.

By one who is practically familiar with what takes place in the process of reducing iron by hydrogen, the causes of the controversy above noticed, are easily explained. The reduction tube, when ready for the operation, is nearly filled with red oxide of iron, obtained by calcining the sub-carbonate of iron of the *Pharmacopœia*, to free it from its water of hydration. After the current of hydrogen is established and the fire is kindled, the operator is made aware of the commencement of the reduction by the appearance of aqueous vapors at the exit pipe; and when it is continued for a length of time and stopped, the contents of the tube will vary considerably in appearance. Near the point of ingress of the gaseous current, if the heat has been sufficient, the red powder will have assumed an iron gray color, whilst further along, the color will be blacker, and finally perfectly black. If the tube and contents have not been heated to a dull red, the reddish color of the oxide will be retained at such point, and it sometimes happens in the same operation, that the unreduced oxide and all the grades of reduction to the perfect metallic state, may be observed. It never happens in practice, that all the oxide is reduced, as the fire would have to be continued too long, to the injury of the reduced portion, and it is usual to employ the partially reduced oxide of one operation for the next. The line of complete reduction is distinctly marked, so that the chemist can by means of a spatula separate readily the perfectly reduced iron; yet between this and the black oxide there is a portion consisting of metallic iron and oxide in variable proportion.

Hence there is no reason why imperfectly reduced iron should be sold except either through ignorance of the process, carelessness or fraud. Mr. Heathfield, therefore, in alleging the action of hydrogen in a hot tube as a reason for purity, is only conditionally correct.

It sometimes happens in operating in a 4 inch tube, that the interior particles in a part of the oxide are black, and the exterior iron grey. Now in reference to color, it may be said that no metallic iron is *perfectly* black; but when the oxide is reduced at the lowest heat possible, so that its particles do not contract or weld together by excess of heat, after reduction, it is of a dark iron grey hue, and will dissolve, with rapid effervescence of hydrogen in dilute sulphuric acid like a carbonate; when, however, the heat has been allowed to become cherry red, after the reduction, the particles contract more and more, until, if the heat has been continued long enough, a metallic mass is obtained, difficult to powder, and requiring the avoidance of blows of the pestle to prevent its condensation into solid shining pebble-like masses. The color of over-heated iron is light iron grey, with a peculiar lustrous appearance, derived from the trituration necessary to pulverize it.

Now when the operator opens his tube and finds that he has but a partial product, and that the interior part of the oxide is not thoroughly reduced, he is tempted to overlook the presence of the latter, and convert all to powder. - This may be occasional and accidental, or habitual, according to the conscientiousness or knowledge of the manufacturer, and whilst this is the case, iron by hydrogen will constantly vary in composition; we see by the analyses of Dr. Wilson admitted by Mr. Heathfield, that his own preparation varies from 2 to 22 per cent of foreign matter.

Undoubtedly, the best condition of this preparation, when removed from the tube, is that of a light spongy mass, like light carbonate of magnesia, yet more compressible, and of a dull, rather dark iron grey color. When a fragment is struck on a bright anvil with a smooth hammer, a thin brilliant lamina of metal is obtained, and when the powder is strongly pressed with a bright spatula, with traction, the compressed surface exhibits a metallic lustre.

It may be well to say a word in reference to the sulphur

found in reduced iron: it may arise from two sources ; 1st, from the presence of sulphureted hydrogen in the hydrogen used, when the sulphuret present is that of iron ; or it may be due to the deoxidation of sulphate of soda in the oxide of iron, when sulphuret of sodium is the sulphuretted body, as may be proved by washing the iron. It is almost impossible, on a manufacturing scale, to wash all the sulphate of soda from the hydrated carbonate of iron in the process of making the sub-carbonate, hence it is necessary to thoroughly wash the dried sub-carbonate after it is pulverized, till the washings are free from sulphate. The success of this operation is known by testing the reduced iron with dilute sulphuric acid, when, if any sulphuret is present, the odor of hydro-sulphuric acid is perceptible.

In my experience in operating with a wrought-iron tube forty inches long and four inches diameter, the charge of oxide is six to eight pounds, and the hydrogen is furnished by the solution of twelve pounds of zinc in dilute  $\text{SO}_3$ . The current is kept up rapidly for eight hours, during which time the tube is kept at as near a dull red heat as possible ; and after the removal of the fire and the cooling of the walls of the furnace with water, the evolution of gas is moderated to a slow bubbling at the exit end, until the tube is *perfectly cold*. The yield of reduced iron on the average, is between two and four pounds to an operation. The black pulverulent oxide in the other end of the tube is used for part of the next charge. The most difficult point in the process is the regulation of the heat ; the next, the management of the gas, which should be carefully purified by passing it twice through a solution of subacetate of lead.

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#### PHARMACEUTICAL GLEANINGS.

The following formula has been received from Mr. Charles T. Bonsall of Trenton, New Jersey.

<i>Solutio Doveri.</i> (Liquor Morphiæ Compositum.)	
Take of Acetate of Morphia,	one drachm.
Diluted acetic acid,	one fluidounce.
Dissolve, and add	
Diluted alcohol,	seven fluidounces.
Wine of ipecac.	two fluidounces.

The above preparation originated, I believe, with Dr. J. B. Coleman, of Trenton, N. J., and was intended to represent the Pulvis Doveri in those cases where it is difficult to administer the latter compound from an irritable condition of the gastric organ. It is an elegant preparation, and a favorite with those who are in the habit of prescribing and using it. It is kept at the shops and dispensed with directions for use, being considered preferable to the ordinary preparations of opium, for not being apt to cause nausea, headache or constipation of the bowels.

Ten minims of the preparation are equivalent to one-eighth of a grain of acetate of morphia, and one-eighth of a grain of ipecacuanha, and fourteen minims equal a grain of opium.

*The literature of the shop.*—The following is a literal copy of a prescription recently sent to a drug store in Philadelphia. It may serve to show one feature of the dangers to which our fellow-citizens are exposed by such ignorance, and that the druggists are not always the only ones accountable for the many mistakes that occur in dispensing.

“ R Portocholorid gr. vi.  
 Cholchochum gr. x.  
 M. and pill, iii.  
 R Tart. potash ʒj.”

The latter item was, of course, taken to mean what it said, but “the doctor” sent word back, that he “wanted Cream of Tartar!”

*Risum teneatis, amici?*

*Febrifuge properties of the Olive.*—Mr. Daniel Hanbury, in the Pharmaceutical Journal for February, 1854, gives the following information from Mr. Sidney H. Maltass of Smyrna.

“ \* \* \* I may here tell you of a discovery I made in 1843, which has proved valuable. I was in the island of Mytelene, and at a time when fever and ague of the worst description were raging in the island;—in fact, it was so bad that death ensued frequently after a week or ten days. The small quantity of quinine at the druggist’s was soon exhausted, and I could procure none to administer to patients. Knowing that biberine and salicine were often used for fever and ague, I turned over in my mind all the bitters I could think of which might prove effectual. Many were poisonous, and I rejected them, then thought of *olive leaves*, and after several trials made on myself, I commenced administering doses of a decoction of the leaves, say two handfuls boiled in a quart of water till evaporation had reduced it to a pint. This I gave in doses of a wine-glassful every three or four hours. Obstinate cases of fever gave way before it; and for many years I have found it more effectual than quinine.

“I have recommended it to our medical men, and although at first they ridiculed the idea, they all use it now. It is a most valuable remedy for the poor in an olive-growing country.”

Mr. H. considers this discovery more interesting as corroborating some observations made many years since in France.

According to Dr. Pallas, the olive leaves and bark contain a bitter crystallizable principle which communicates a faint blue color to reddened litmus paper. The bark contains two per cent.

The pharmaceutical preparations of olive leaves are a tincture (1 to 8) and an alcoholic extract.

*Hydrocotyle Asiatica*, a cure for *Leprosy*.—Dr. Boileau of Mauritius, afflicted with leprosy, employed the leaves of the *Hydrocotyle Asiatica* with decided success in his own and other cases. M. Lepine, of Pondicherry, has corroborated the statement of Dr. Boileau, as to the usefulness of this plant in leprosy, at the Leper Hospital. It is taken in powder, decoction and syrup, and its use continued several weeks.

*Hydrocotyle Asiatica* is an umbelliferous plant growing extensively in Asia, and has been used before the present application of it in India, as an alterative for children. Those who wish to learn further of this remedy, are referred to Pharm. Jour. xiii. page 427, which contains a long extract in relation to it from the Madras Gazette.

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ON THE INCOMPATIBILITY OF IODIDE OF POTASSIUM WITH  
CALOMEL AND OTHER PREPARATIONS OF MERCURY, AND ON  
A SIMPLE MODE OF TESTING PILLS, POWDERS, AND OTHER  
MEDICINES FOR THE PRESENCE OF MERCURY.

BY WILLIAM PROCTER, JR.

It frequently happens that iodide of potassium is prescribed with calomel, blue mass, and other mercurials, directly or indirectly, and it is well worthy the consideration of physicians to discover what changes occur by their contact in the stomach or circulation, and how far the action of a mercurial is modified, and its effects accelerated or retarded. To make the subject clearer, let us see what changes may and do occur in the test tube, that medical men may draw what conclusions the premises will warrant, with regard to the reactions that may occur in the human system.

1st. When calomel and iodide of potassium, in equivalent proportions, are treated with boiling water, chloride of potassium is

found in solution, and green protiodide of mercury remains insoluble. When they are treated with cold water, the same change occurs more slowly.  $\text{HgCl}$  and  $\text{KI}$ , becoming  $\text{HgI}$  and  $\text{KCl}$ .

2d. If, however, the iodide of potassium is in excess, the protiodide of mercury is converted into biniodide and metallic mercury, the former immediately combining with a part of the excess of iodide to form soluble iodohydrargyrate of potassium.  $2\text{HgI}$  and  $2\text{KI}$  yield  $2\text{KI}, \text{HgI}^2$ , and  $\text{Hg}$ .

3d. When black oxide of mercury is added to an excess of iodide of potassium, it is converted first into protiodide, and this subsequently decomposed into biniodide and metallic mercury, part of the iodide of potassium suffering decomposition to yield the iodine which is replaced by oxygen, so as to form free potassa; thus,  $2\text{HgO}$  and  $2\text{KI}$ , become  $2\text{HgI}$  and  $2\text{KO}$ . Then the protiodide and excess of iodide of potassium react as above, to produce free mercury and iodohydrargyrate of potassium.

4th. When red oxide of mercury is added to an excess of iodide of potassium, they are first, by double decomposition, converted into biniodide of mercury and potassa, and the former then into iodohydrargyrate of potassium, whilst free potassa is found in the clear solution which is strongly alkaline; thus  $\text{HgO}^2$  and  $4\text{KI}$  become  $2\text{KI}, \text{HgI}^2$  and  $2\text{KO}$ .

5th. When subsulphate of mercury (turpeth mineral) is mixed with an excess of iodide of potassium, in strong solution, the yellow salt is instantly turned red by the formation of biniodide, which is gradually dissolved—the change may be represented by the following equation:  $3\text{HgO}^2, 2\text{SO}^3$  and  $12\text{KI}$  yield  $3(2\text{KI}, \text{HgI}^2) + 2(\text{KO}, \text{SO}^3) + 4\text{KO}$ , the solution being strongly alkaline.

6th. When white precipitate is mixed with an excess of iodide of potassium it soon dissolves—the solution smells of ammonia.

7th. When blue mass is digested with a solution of iodide of potassium, the filtered liquid has an alkaline reaction, and contains mercury, as evidenced by its precipitation when a drop is placed on a bright copper.

*Lastly*, When mercury is boiled with a strong solution of iodide of potassium, and filtered, the solution contains mercury, and is decidedly alkaline. It follows, therefore, that iodide of potassium is decomposed with the formation of biniodide of mercury and potassa, yet the rationale is not very clear, inasmuch



as no evolution of hydrogen is apparent. The same occurs more slowly without heat. In every instance, a drop of the above solution put on bright copper, instantly precipitates mercury and causes a silvery stain.

Now it is well known that iodide of potassium proves useful in cases where mercurials have been taken to abuse; do not the reactions above detailed show that in every ordinary form of mercurial, this salt exerts a solvent power, which, in connection with its ready elimination by the bladder, may prove efficacious by acting as a collector of the metal in whatever form of combination it may exist in the system? Do they not suggest that physicians should observe due care in the use of calomel, protiodide of mercury and blue mass, in connection with iodide of potassium, as the iodo-hydrargyrate of potassium, which is formed by this reaction, exhibits its peculiar effects in doses of one-twelfth of a grain?

It would probably repay the time occupied in the observations, if some of our medical friends would watch the effect on the composition of the urine in cases where iodide of potassium was being administered, as in old syphilitic cases, where mercury had been used to excess.

Before concluding, it is proper to state that my attention was directed to the subject by the statements of Mr. Morgan on the use of iodide of potassium as a test of mercury, (see *Am. Jour. of Pharm.*, xxiv. pp. 177.) This test is admirably calculated to discover the presence of mercury in any form in a medicine, as in pills, powders and mixtures; and especially for demonstrating the presence of the metal in those *vegetable QUACK PILLS* which sometimes act so much like the mercurial purgatives.

All that is necessary is to take a penny, dip it in nitric acid to produce a bright, clean surface, scrape on to the penny about a grain of the pill to be tested, add to it three grains of iodide of potassium and three drops of water, and mix them with the point of a penknife. If mercury is present, a silvery stain will be found on the copper. Where the metal exists as blue pill, the reaction requires more time, but it is equally certain. The experiment can easily be tried with a compound cathartic, or a Plummer's pill.



## ON THE MANUFACTURE OF AMMONIA AND AMMONIACAL SALTS.

(Concluded from page 139.)

A great variety of processes have been patented within the last few years by Mr. Laming and Mr. Hills, having for their object the purification of coal gas and the obtaining of ammonia and ammoniacal salts. In his patent of November 4, 1847, Mr. Laming claims the use of the undermentioned salts for the above named purposes, the solution of which is absorbed into sawdust, or other porous material, and placed in the purifying vessel of the gas-works—viz., chloride of calcium, the muriates and sulphates of manganese, iron, and zinc; the carbonates of manganese, iron, zinc and lead. The oxides of manganese, iron, zinc, or lead, may also be added to any of the above materials. The ammonia or ammoniacal salts contained in the spent purifying materials may be removed by heat or washing.

The specification of the same patent contains an account of certain modes of treating the ammoniacal liquor of gas-works, so as to obtain from it the sulphate of lead, a solution of sulphate of ammonia, and either an oxide or carbonate of lead, of sufficient purity to serve as, or be converted into, white lead.

Mr. Laming converts the hydrosulphate of ammonia contained in gas-liquors into carbonate of ammonia by the following process:—A mixture of deutoxide of copper and charcoal, or other form of carbon in fine powder, in the proportion of twelve parts by weight of the former to one of the latter, is introduced into a retort made red-hot and furnished with an eduction-pipe, which passes through cold water, and finally enters into the gas-liquor. The formation of carbonic acid gas soon takes place by the union of the carbon with the oxygen of the metal, and this gas combining with the base of the hydrosulphate of ammonia contained in the gas-liquor, converts it into carbonate, with liberation of hydrosulphuric acid. When the carbonic acid gas ceases to come away, nearly all the carbon will have disappeared from the retort, and the copper which it contains become reduced to the metallic state. The charge is then drawn and left to cool, while a second charge of similar materials is being worked off, during which time the copper re-absorbs oxygen from the air, and becomes again deutoxide of copper, which may then be used anew with fresh carbon.

Mr. Hills, in his patent of Nov. 28, 1849, claims the use of the sub-sulphates, the oxychlorides, and the hydrated or precipitated oxides of iron (which he prefers to use in a rather damp state), either by themselves or mixed with sulphate of lime, or sulphate or muriate of magnesia, baryta, strontia, potash, or soda; and he causes them to be absorbed into or mixed with sawdust or peat charcoal in coarse powder, or breeze, or other porous or absorbent material, so as to make a very porous substance easily permeable by the gas. This material is to be put into a purifier (a dry lime purifier will answer the purpose) and the gas is to be passed through it; by this means the ammonia and other products are absorbed. By the admission of air and application of heat to the material so saturated with ammonia, this substance is driven off and collected by passing it through a condenser, or the ammonia may be fixed by an acid and converted directly into sulphate or muriate of ammonia. If sulphate of lime or sulphate of magnesia be present in the purifying material, these salts will be decomposed with the formation of sulphate of ammonia, which may then be washed out of the purifying material, concentrated by evaporation, and crystallized.

Mr. Laming, in his patent of April 23, 1850, claims the use of muriate of iron, of muriate of iron decomposed by lime into chloride of calcium and oxide of iron, of sulphate of iron decomposed by its equivalent quantity of chloride of sodium, adding to the solution of muriate of iron thus produced, enough hydrate of lime to decompose it into chloride of calcium and precipitated oxide of iron. In these, and in various modified forms of the same process, muriate of ammonia may be obtained from the purifying material when it has served its purpose, and has been removed from the purifying vessel. Mr. Laming also claims the use of a mixture of sulphate of lime and sulphate of iron, of a mixture of hydrated or precipitated oxide of iron with carbonate of lime, magnesia, carbonate of magnesia, or magnesian limestone, or chloride of magnesium or sulphate of magnesia and water, phosphate of lime dissolved in hydrochloric acid, and, lastly, of a mixture containing sulphate of magnesia or chloride of magnesium or calcium, or one or more of them in combination with oxide of copper, and mixed or not with lime or magnesia, or both or either, or both of the carbonates of those earths. In

all these cases, the salts employed are mixed with sawdust or some other porous substance, and the material so compounded is placed in the purifying vessels of the gas-works. The gas in its passage through the purifiers gives up its ammonia, which is afterwards obtained as sulphate or muriate of ammonia, by washing the material when it has become fully saturated with ammonia.

Messrs. Crane and Jullien, in their patent of January 18, 1848, describe a method of manufacturing ammonia in the state of carbonate, hydrocyanate, or free ammonia, by passing any of the oxygen compounds of nitrogen, together with any compound of carbon or even free hydrogen, through a tube or pipe containing any catalytic or contact substance, as follows:—Oxides of nitrogen (such for instance as the gases liberated in the manufacture of oxalic acid), however procured, are to be mixed in such proportion with any compound of carbon and hydrogen, or such mixture of hydrogen and carbonic oxide or acid as results from the contact of the vapor of water with ignited carbonaceous matters, and the hydrogen compound or mixture containing hydrogen, may be in slight excess, so as to ensure the conversion of the whole of the nitrogen contained in the oxide so employed, into either ammonia or hydrocyanic acid, which may be known by the absence of the characteristic red fumes on allowing some of the gaseous matter to come in contact with atmospheric air. The catalytic or contact substance which Messrs. Crane and Jullien prefer, is platinum, which may be either in the state of sponge, or asbestos coated or covered with platinum. This catalytic substance is to be placed in a tube, and heated to about 600° Fahr., so as to reduce the temperature of the product, and at the same time prevent the deposition of carbonate of ammonia, which passes onwards into a vessel of the description well known and employed for the purpose of condensing carbonate of ammonia. The condenser, for this purpose, must be furnished with a safety-pipe to allow of the escape of uncondensed matter, and made to dip into a solution of any substance capable of combining with hydrocyanic acid or ammonia where they would be condensed. A solution of salt of iron is preferable for this purpose.

Mr. Hills took out a patent, October 19, 1848, for improvements in treating certain salts and gases or vapors, in which he

describes a method of distilling the volatile solution of ammonia for the purpose of producing ammonia of a more highly concentrated character. For this purpose he employs a tower, circular by preference, which should be about ten diameters in height; this is to be furnished with gratings, placed from three to four feet apart throughout the whole height of the tower; the spaces between each being filled with coke, pieces of earthenware, or other substances, to form greatly divided media. The volatile solution to be distilled, whether pure or combined with other matters, is to be introduced at the top of the tower, and allowed to percolate through the coke, while, at the same time, a jet of steam or heated air is introduced at the bottom, which, in its ascent, meets the ammonia distributed over a great amount of surface, by which means the more volatile parts of the ammonia become vaporized and carried off by the steam; this being collected at the top and conveyed to a refrigerator and condensed, while the waste liquor escapes at the bottom of the tower. As an auxiliary to this apparatus, another tower is placed on the top of that already described. This the patentee calls a concentrator: it is filled with the same materials as the other, and furnished with a coil of pipe, through which the solution of ammonia is to be passed when introduced to the lower tower; the vapors arising from this partially vaporize the ammonia in the pipe, while, at the same time, the more aqueous parts of the vapors are condensed before passing off to the condenser.

Dr. Richardson's process, patented January 26, 1850, for manufacturing sulphate of ammonia, consists in subliming the double salt of sulphate of magnesia and ammonia obtained by the following method:—The ammoniacal liquor of the gas-works is added to a solution of sulphate of magnesia, with application of heat, until the solution is rendered nearly neutral; the precipitate is then allowed to subside, and the clear liquor drawn off, concentrated by boiling to from 50 to 60° Twaddle (spec. grav. 1,250 to 1,300), and crystallized. If preferred, the gas-water may be neutralized by sulphuric acid before it is added to the solution of sulphate of magnesia. The double salt of sulphate of magnesia and ammonia may also be obtained, by subjecting the sulphate of magnesia, either in solution or in a damp state, to a current of ammoniacal gas, obtained by the distilla-

tion of gas-water, guano, or any other matter from which ammonia can be procured by destructive distillation with quicklime; the ammoniacal gas being purified before use by passing it through water.

Nichiel's mode of obtaining sulphate of ammonia, patented April 30, 1850, is as follows: The ammoniacal liquors of the gas works are combined with sulphate and oxide of lead, which is obtained and prepared in the following way: Sulphuret of lead in its natural state is taken and reduced to small fragments by any convenient crushing apparatus. It is then submitted to a roasting process, in a suitably arranged reverberatory furnace of the following construction: The furnace is formed of two shelves, or rather the bottom of the furnace and one shelf, and there is a communication from the lower to the upper. The galena or sulphuret of lead, previously ground, is then spread over the surface of the upper shelf, to a thickness of about 2 or  $2\frac{1}{2}$  inches, and there it is submitted to the heat of the furnace. It remains thus for about two hours, at which time it is drawn off the upper shelf and spread over the lower shelf or bottom of the furnace, where it is exposed to a greater heat for a certain time, during which it is well stirred, for the purpose of exposing all the parts equally to the action of the heat, and at the same time the fusion of any portion of it is prevented. By this process the sulphuret of lead becomes converted, partly into sulphate and partly into oxide of lead. This product of sulphate and oxide of lead is to be crushed by any ordinary means, and reduced to about the same degree of fineness as coarse sand. It is now to be combined with the ammoniacal liquors, when sulphate of ammonia and sulphuret and carbonate of lead will be produced.

In order to obtain sulphate and muriate of ammonia with the greatest possible economy, Mr. Spence patented, November 12, 1850, the following process:—A series of two or more, say for instance four cylindrical boilers are placed at such a distance, one above the other, that the contents of the upper boiler may be drawn off into the one next below it. Each boiler is furnished with a cock, to allow of the passage of the contents of the boiler from one to the other throughout the series. Each of these vessels contains gas-liquor, from a reservoir of which a pipe

passes to the upper boiler, which is also furnished with an exit-pipe. Into the lower boiler high-pressure steam is passed, which soon causes the gas-liquor to boil, and the vapor of ammonia and water passes off through an exit-pipe into the boiler placed next above it in the series, the liquor in which is thus also brought to boil, the vapor of ammonia and water passing off from it in the same way to the boiler next above it, and so on throughout the series. By the time the vapor of ammonia passes off from the uppermost boiler it has become so concentrated, that on passing it into sulphuric or muriatic acid, a concentrated solution of either of those salts is obtained, of sufficient specific gravity to crystallize without evaporation, and thus a considerable saving in fuel and time is effected, and the ammoniacal gas-liquor is most thoroughly exhausted. Fresh supplies of ammoniacal liquor are constantly furnished to the uppermost boiler from the reservoir; whilst the partially exhausted liquors are run from the higher to the lower vessels in succession, and the exhausted liquor run off to waste from the lowermost vessel of the series. As the gas-liquors often contain some fixed ammoniacal salts, Mr Spence recommends the addition of lime to the contents of the boilers, in order to render free the ammonia contained in such salts.

Mr. Wilson patented, December 7th, 1850, the following process of obtaining sulphate of ammonia from the waste products of coke-ovens and other furnaces. For this purpose he employs the following apparatus:—An iron column lined with lead, or a brick column lined with fire-bricks and well burnt clay, is filled with coke or round pebbles; this column has an area or cross section five or six times that of the chimney connected with the coke-ovens, and is from twelve to fifteen feet in height; at the bottom of this column, which can be supported on cross bars, is a space of three feet left clear, in which is placed a cistern, constructed of the same materials as the column, and another similar cistern is placed at the top of the column, its bottom being pierced full of holes. The lower cistern is then filled with sulphuric acid so diluted, that, when saturated with ammonia, it shall not form a solution of sufficient density to cause, on evaporation by the heat of the column, an incrustation of sulphate of ammonia. The gaseous products of combustion are then made to pass through the lower cistern up the column of coke, and as



the acid liquor of the lower cistern is continually forced by suitable means into the upper perforated cistern, the ammonia in its passage upwards comes into contact with the acid trickling down through the column, and is thus prevented from passing off with the other products of combustion, which are conveyed by an exit-pipe into the chimney. When the acid liquor has become neutralized by ammonia, it is drawn off, filtered, evaporated, and crystallized, a fresh supply of acid being placed in the lower cistern.

Mr. Laming patented, August 12th, 1852, the following method of manufacturing sulphate of ammonia from the ammoniacal liquors of gas-works. The ammonia is first separated in its simple form, or as carbonate of ammonia, by any known means, after which it is converted into sulphate of ammonia, by causing streams of sulphurous acid to be brought into contact with it, and the sulphite of ammonia is finally converted into sulphate by exposing it to the combined influences of atmospheric air and water.

Dr. Ure, in his *Dictionary of Arts and Manufactures*, states that 7200 gallons of ammoniacal gas-liquor treated with 4500 lbs. of sulphuric acid, sp. grav. 1625, produces 2400 gallons of solution of sulphate of ammonia, of sp. grav. 1150. As a gallon of solution of ordinary sulphate of ammonia, of the above strength, contains three pounds of crystallized sulphate, it follows that in the above case the product is at the rate of one pound per gallon of gas-liquor, which is almost double the quantity ordinarily obtained.

The quantity of ammoniacal liquor obtained at one of the London gas-works, during one year, from the distillation of 51,100 tons of coal, was 224,800 gallons.

*Ammonia Meter.*—In order to determine the strength of any given solution of ammonia, Mr. J. J. Griffin, of Baker street, has constructed a useful instrument, termed an ammonia meter. This instrument is founded on the following facts: That mixtures of liquid ammonia with water possess a specific gravity, which is the mean of the specific gravities of their components; that in all solutions of ammonia, a quantity of anhydrous ammonia, weighing  $212\frac{1}{2}$  grains, which he calls a *test-atom*, displaces 300 grains of water, and reduces the specific gravity of the



solution to the extent of .00125; and, finally, that the strongest solution of ammonia which it is possible to prepare at the temperature of 62° Fahr., contains in an imperial gallon of solution one hundred test-atoms of ammonia.

The ammonia meter is accompanied by a table, containing six columns of numbers. The first column shows the *specific gravity* of the solutions; the second column the *weight* of an imperial gallon in pounds and ounces; the third column the *percentage* of ammonia by weight; the fourth column the *degree* of the solution, as indicated by the instrument, corresponding with the number of *test-atoms* of ammonia present in a gallon of the liquor; the fifth column shows the number of *grains* of ammonia contained in a gallon; and the sixth column the *atomic volume* of the solution, or that *measure* of it which contains one test-atom of ammonia. For instance, one gallon of liquid ammonia, sp. grav. 880 weighs 8 lbs. 12.8 oz. avoirdupois, its percentage of ammonia, by weight, is 33.117, it contains 96 test atoms of ammonia in one gallon, and 20400.0 grains of ammonia in one gallon; and, lastly, 104.16 septems containing one test atom of ammonia. Although no hydrometer, however accurately constructed, is at all equal to the centigrade mode of chemical testing, yet the Ammonia Meter and the table accompanying it, will be found very useful to the manufacturer, enabling him not only to determine the actual strength of any given liquor, but the precise amount of dilution necessary to convert it into a liquor of any other desired strength, whilst the direct quotation of the number of grains of real ammonia contained in a gallon of solution of any specific gravity, will enable him to judge at a glance of the money-value of any given sample of ammonia.—*Pharm. Journ.* Sept., 1853.

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#### CONSTITUTION OF THE "MELT" OBTAINED IN THE MANUFACTURE OF FERROCYANIDE OF POTASSIUM.

Liebig is of opinion that the raw product of melting contains no ferrocyanide, but only cyanide of potassium, while Gmelin, Runge, and others, adopt a contrary view. The results referring to the subjects which have hitherto been obtained, are very contradictory, and for this reason Reimann has, at the sugges-

tion of Professor Fresenius, instituted a number of experiments on the "melts" obtained from several factories, and the behavior of these various ingredients in the presence of water. These experiments have fully confirmed the opinion that the fresh and still warm "melt" does not contain any ferrocyanide, and that this salt is formed only by the action of water or moist air upon the melt.

*Melt from the Buxweiler factory* (Bas Rhin.)—Apparently produced at a very high temperature; very hard, fracture presenting small crystals of sulphuret of iron.

1. Alcohol dissolved out sulphocyanide and much cyanide of potassium, with a little caustic potash.

2. The residue, after perfect exhaustion with alcohol, was then treated with cold water; the first portion of liquid contained much cyanide of potassium, sulphuret of potassium, and carbonate of potash, sulphuret of copper dissolved in cyanide of potassium, and minute traces of ferrocyanide of potassium. The second portion of liquid contained the same substances, the proportion of ferrocyanide being greater. The residue consisted of carbon, sulphuret of iron, metallic iron, and carburet of iron.

3. A portion of the melt was digested for twenty-four hours with water, air being excluded. The solution obtained contained besides cyanide of potassium a tolerably large quantity of ferrocyanide.

4. A portion of the moistened melt was exposed to a stream of carbonic acid in a closed apparatus, and the evolved gas passed through an acidulated solution of silver. In this way, sulphuret and cyanide of silver were precipitated, which proves that the melt contained cyanide of potassium, for carbonic acid does not disengage hydrocyanic acid from solutions either of sulphocyanide or ferrocyanide of potassium.

5. A portion of the melt was treated with water in a flask at a temperature of about 122° Fahr. A very small evolution of ammonia was observed, and the solution contained a large quantity of ferrocyanide, together with some cyanide of potassium.

6. Another portion was boiled for some time with water in a retort. The evolution of ammonia was considerable, and the solution contained a great quantity of ferrocyanide of potassium.

7. A portion of the melt was digested with water in a small gas generator at 212° F., and the gas evolved passed first through

water and then through a tube filled with asbestos, moistened with hydrochloric acid. After the lapse of twenty-four hours the solution yielded hydrocyanic acid when treated with bichromate of potash (to destroy the smell of sulphureted hydrogen) and sulphuric acid. A faint ammoniacal odour was likewise perceptible at the end of three, four, and even five days, when the presence of cyanide of potassium in the solution could be distinctly recognized.

8. The melt which had been treated in this manner for seven days, was mixed with freshly precipitated sulphuret of iron, and at the end of twenty-four hours the solution no longer contained cyanide of potassium.

9. About twenty grm. of the melt were digested with about three grm. of fused potash and water in the same apparatus, at  $212^{\circ}\text{F.}$ , and after twenty-four hours the solution still contained cyanide of potassium, which did not entirely disappear even after the lapse of seven days.

10. The above mass was then mixed with fresh precipitated sulphuret of iron, and within twenty-four hours all the cyanide of potassium was converted into ferrocyanide.

The melts from other factories gave corresponding results.

*Cyanide of Potassium* (prepared according to Liebig's method), digested with fresh precipitated sulphuret of iron and water, was entirely converted into ferrocyanide within two days.

When digested with fresh sulphuret, caustic potash, and water the change of the cyanide into ferrocyanide was completed within twenty-four hours.

It appears from the above experiments that it is chiefly the finely divided amorphous sulphuret of iron which determines the rapid conversion of the cyanide into ferrocyanide, while the crystalline sulphuret (contained in many melts produced at a high temperature) acts much more slowly. Consequently the presence of sulphuret of potassium in the melts is a favorable element in the formation of ferrocyanide of potassium, for then on the addition of sulphate of iron fresh precipitated sulphuret of iron is produced.

A temperature varying from  $158^{\circ}$  to  $176^{\circ}$  F. appears to be the most favorable for the extraction of the melt, for at that temperature the formation of ammonia is but small, and the solvent action of the water is considerably augmented.

There is apparently no doubt that the presence of caustic potash facilitates the conversion of cyanide of potassium into ferrocyanide.—*London Pharm. Journ.*, March, 1854.

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PREPARATION OF PARAFFIN AND PURE ACETIC ACID UPON A LARGE SCALE FROM THE DISTILLATION PRODUCTS OF WOOD.

By REINHOLD V. REICHENBACH.

The author having had occasion to prepare a large quantity of pure paraffin, was desirous of adopting some less tedious process than that by which his father obtained this substance in the first instance. Under these circumstances he was induced to try the action of sulphuric acid at a high temperature, supposing that it would then be more efficacious in destroying the empyreumatic substance mixed with the paraffin. For this purpose he half-filled a large glass retort with fuming sulphuric acid, and added one-third its weight of well pressed raw paraffin. The temperature was gradually raised in a sand bath until distillation began, and after a time he found that the whole of the paraffin had passed over and presented an appearance of perfect whiteness and purity.

From the success of this operation, he applied the method to the preparation of pure acetic acid. The substance employed was the ordinary raw acetate of soda. This salt, containing a large quantity of empyreumatic resin, yielded, when distilled with concentrated sulphuric acid, about half its quantity of very strong acetic acid, which was clear, perfectly colorless, and free from any empyreumatic odour. It was not until the temperature was raised, in order to continue the distillation, that the distillate began to present a brownish-yellow color, and at the same time a peculiar turbidity. Both these circumstances appeared to be owing to some other cause than the presence of empyreumatic admixtures, and they were found to result from a decomposition of sulphuric acid, by the carbonaceous matter in the retort, and a consequent distillation of sulphur with the acetic acid. The turbid and somewhat colored acid was rendered perfectly pure by redistillation.

The author then endeavored to conduct the distillation in such a manner as to prevent this inconvenience. The layer of acetate and sulphuric acid next to the heated wall of the retort would

obviously become dry first, and acquire a temperature sufficient to set up a reaction between the sulphuric acid and the carbonaceous substance. He therefore interrupted the distillation at this moment, and after well stirring the contents of the retort continued it again. By repeating this two or three times he succeeded in drawing over almost the whole of the acetic acid clear and colorless.

The product thus obtained, of course contained sulphurous acid, and traces of sulphuric acid, carried over mechanically. This objectionable circumstance cannot be altogether avoided, even when pure acetate is used; but both substances may be easily separated by the addition of a little peroxide of manganese or lead, together with a simple redistillation.

The form of apparatus afterwards employed by the author was a basin-shaped vessel of cast-iron, with a broad flat rim, upon which fitted a flat lid, with a copper dome in the centre, capable of being cooled by a stream of water. The iron lid may be removed at intervals, when the distillation is interrupted for the purpose of stirring the contents with shovels. He has thus been able to prepare about a hundred-weight of pure concentrated acetic acid daily.—*London Pharm. Journ.*, March, 1854, from *Jahrbuch der K. K. geologischen Reichsanstalt*, Jahrg. iii., No. 2.

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#### ON THE SACCHARATED ALCOHOLIC EXTRACT OF IPECACUANHA.

By A. G. DUNN, late Apothecary to Kings County Hospital, L. I.

The Cephælis ipecacuanha, being a most efficient remedial agent, and at the same time a very safe and mild one, has been and is still most extensively used; but, owing to numerous adulterations, the dose is rendered quite uncertain, whether given in pill, powder, or otherwise. The tincture, wine and syrup, are likewise of unequal strength, being made after many different formulæ. The chief objection to the powder, however, is its absolute insolubility, thereby causing an unpleasant mixture when prescribed with liquids.

Taking into consideration these facts, and from reading in the *American Journal of Medical Sciences*, No. xlv. p. 229, an article on various saccharine forms of medicines, we were led to at-

tempt the preparation of a *saccharated alcoholic extract of ipecacuanha*, which should be of uniform strength, perfectly soluble and also agreeable to take. The following is the formula: R. Rad. ipecac.  $\bar{\text{z}}$ iv., bruise to a coarse powder, and macerate for thirty days in  $\bar{\text{f}}$ xxvi. of diluted alcohol, shaking it occasionally, then filter and express. The tincture thus formed is to be evaporated to  $\bar{\text{z}}$ ij. with which mix sacch. albi  $\bar{\text{z}}$ viiij., then triturate in a stone mortar until it is entirely dry.

The extract, as above prepared, has the peculiar odor and taste of ipecac.; it is of a brownish-yellow color, and is soluble in water, alcohol, ether, mucilage of acaciæ, &c.; in fact, in all the solutions with which ipecac. is usually combined. The dose required to be exhibited is the same as of the genuine powdered root.

From the more agreeable taste of this article, and its complete solubility in fluids, those physicians who have tried it have given it the decided preference over every other preparation of this valuable drug; and more especially in prescribing for children, for whom its sweet taste adapts it, as an excellent form for combination with other remedies, to be given in powders.

The success attending the administration of this extract, by the physicians of Kings County Hospital (in which institution it was first prepared and brought into notice), and others of the same profession in various parts of the said county, has induced us to publish this paper, in order that physicians generally may have an opportunity of testing its great superiority over the common forms of ipecac. at present in use.—*New York Journ. of Medicine*, March, 1854.

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#### EXAMINATION OF BASSORAH GALLS.

By DR. L. F. BLEY.

The author has examined the so-called Bassorah galls. They were treated consecutively with alcoholic ether, cold water and hot water.

The galls lost 12 per cent. of water in drying. The alcoholic ethereal extract left a residue equal to 17 per cent. on the weight of the galls, of which water dissolved 14 per cent. The portion which was not soluble in water was shaken in ether,

which took up 3 parts of a yellowish fatty oil of a mild taste. The portion insoluble in ether was a brown solid resin; it had a shining appearance, was hard and brittle, burnt when heated over flame, fused, and left a small residue of earthy ashes. The alcoholic solution gave a grayish-white flocculent precipitate with water; it dissolved in caustic alkalies with a fine red color, and in fatty ethereal oils. Concentrated sulphuric acid dissolved the resin, forming a reddish-brown fluid. Nitric acid gave a yellowish solution. The portion of the galls not taken up by ether was exhausted with alcohol, the alcohol distilled off, and the residue treated with water, by which 5 parts of the resin above mentioned were separated. The tannic acid and 8 parts of gallic acid were obtained; these were determined by their behaviour with salts of oxide of iron.

Adding the constituents contained in the watery extracts, the Bassorah galls consist of—

Tannic acid	. . . . .	130 parts
Gallic acid	. . . . .	8 “
Fatty Oil	. . . . .	3 “
Resin	. . . . .	17 “
Extractive with salts	. . . . .	10 “
Linen-starch with small portions of common starch and albumen	} . . . . .	42 “
Fibrine	. . . . .	230 “
Water	. . . . .	60 “

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500 parts.

*Chem. Gaz. Dec. 15, 1854, from Archiv der Pharm. lxxv.*

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#### ON THE ACTION OF CARBONIC ACID UPON QUININE AND CINCHONINE AND ON THE FORMATION OF CRYSTALIZED CARBONATE OF QUININE.

By M. LANGLOIS.

A stream of carbonic acid gas was passed through newly precipitated quinine and cinchonine suspended in water. The prolonged action of the gas causes the quinine and cinchonine to dissolve; the former dissolves more readily than the latter. Both solutions, when exposed to the air, lose a portion of their carbonic acid, the one furnishing crystals of carbonate of quinine,



the other merely cinchonine. Crystallized carbonate of quinine is very readily obtained in this manner by the following process:

10 grms. of sulphate of quinine are dissolved in distilled water, to which a few drops of sulphuric acid have been added. The addition of ammonia to the solution precipitates the quinine, which is collected on a filter and washed, and then diffused, whilst still moist, through a litre of water. The milky fluid is put into a glass vessel, into which well-washed carbonic acid gas, produced by the action of muriatic acid upon marble, is passed. The quinine is entirely dissolved in less than an hour. The solution, although supersaturated with acid, retains an alkaline reaction.

Quinine combines directly with carbonic acid without dissolving, when it is not suspended in a sufficient quantity of water. By the process just described, a perfectly limpid solution is obtained, from which, after a short exposure to the air, crystals of carbonate of quinine are deposited; these continue increasing in size for twenty or twenty four-hours. After this no more is deposited, although the liquid still contains the salt. Spontaneous evaporation only furnishes quinine, which is also instantly precipitated by ammonia, potash and soda. Lime-water produces the same effect, with formation of a deposit of carbonate of lime.

The solution of carbonate of quinine consequently furnishes at first crystals of the saline compound, whilst afterwards this compound is destroyed, giving rise to carbonic acid and quinine. There is a complete analogy between these, phenomena and and those presented by a solution of carbonate and cinchonine. The latter never furnishes crystals, because the salt is present in very small quantity; this no doubt depends on the solubility of cinchonine in water being very little increased by the intervention of carbonic acid.

Carbonate of quinine forms transparent acicular crystals which soon effloresce when exposed to the air; they are soluble in alcohol, but insoluble in ether; they render reddened litmus-paper blue. With acids they produce a brisk effervescence.

At a temperature of  $230^{\circ}$  F. they are decomposed; carbonic acid is evolved, and the quinine remains without alteration. It only fuses at  $338^{\circ}$  F. The decomposition of carbonate of qui-

nine at so low a temperature furnishes a ready means for its analysis in the following manner:—A glass tube, 12 or 15 centims. in length, and closed at one end, was weighed, and 0.399 grm. of carbonate of quinine introduced into it. It was then connected, by means of a cork covered with india-rubber, with a bent tube, which passed under a graduated bell-glass placed over some mercury in a test-glass. The extremity of the tube passed the surface of the metal, so as to reach into the empty part of the bell-glass intended for the reception of the carbonic acid gas. The closed tube containing the salt was then heated in the oil-bath to about  $230^{\circ}$  F. Just before this temperature is reached, the carbonate of quinine is decomposed, the carbonic acid being driven off without any sensible change being produced in the physical characters of the salt.

The 339 milligrms. of the salt employed in this experiment furnished 21.36 cub. centims. of carbonic acid gas at  $32^{\circ}$  F., and a pressure of 76 centims. This volume of gas weighs 0.0422 grm. The evolution of gas ceases long before the oil-bath reaches the temperature of  $338^{\circ}$  F., at which the quinine fuses and entirely loses its water. The moisture which adheres to the side of the tube is readily removed by means of a few pieces of blotting-paper. The weight of the quinine, obtained by weighing the tube after the experiment and deducting the weight of the empty tube, was 321 milligrms. 0.399 grm. of carbonate of quinine consequently furnished—

	Grm.	per cent.	
		Found.	Calculated.
Quinine	0.3210	80.45	80.21
Carbonic acid	0.0422	10.58	10.88
Water	0.0358	8.97	8.91

These numbers lead to the formula ( $C^{20}H^{12}NO^2, HO$ )  $CO^2$  HO for this salt. Six successive experiments on different quantities of the salt all led to the same results. As it must be regarded as neutral, we thus, in ascertaining its composition, fix the equivalent of quinine, which in this case agrees with that admitted by Leibig.

This decomposition of carbonate of quinine at a low temperature has also shown that this salt is not formed by double decomposition when a saline solution of quinine is treated with a solution of carbonate of potash or soda. The precipitate formed

consists only of quinine, which always retains a larger or smaller quantity of the carbonate employed, in spite of repeated washing. It is to the presence of this that the precipitate owes its property of effervescing with acids; but when fused in a glass tube, it does not furnish the least trace of carbonic acid. The same applies also to cinchonine, and perhaps even to all the vegetable bases.—*Ibid*, from *Comptes Rendus*, Nov. 7, 1853, p. 727.

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#### ON THE VENOM OF SERPENTS.

By J. GILMAN, A. M., M. D., LL. D.

There is much in the history and habits of the reptile tribes, however repulsive they may be in appearance, that is very interesting. During a sojourn of two or three months in the interior of Arkansas, which appears to me to be the paradise of reptiles, I paid some attention to that branch of natural history called ophiology. I found four distinct varieties of rattlesnakes (*Crotalus*,) of which the *Crotalus Horridus* and *Crotalus Kirtlandii* are by far the most numerous. The former is the largest serpent in North America. The family of moccasin snakes (*Coluber*) is also quite numerous, there being not less than ten varieties, most of which are quite as venomous as the rattlesnake. By dissecting great numbers of different species I learned that the anatomical structure of the poisoning apparatus is similar in all the different varieties of venomous serpents. It consists of a strong frame-work of bone, with its appropriate muscles in the upper part of the head, resembling and being in fact a pair of jaws, but externally to the jaws proper, and much stronger. To these is attached by a ginglymoid articulation, one or more moveable fangs on each side, just at the verge of the mouth, capable of being erected at pleasure. These fangs are very hard and sharp and crooked, like the claws of a cat, and hooked backwards, with a hollow from the base to near the point. I have occasionally seen a thin slit of bone divide this hollow, making two. At their base is found a small sac, containing two or three drops of venom which resembles thin honey. The sac is so connected with the cavity of the fang during its erection, that a slight upward pressure forces the venom into the fang at its base, and it makes its exit at a small slit or opening near the point, with considerable force; thus it is carried to the bottom

of any wound made by the fang. Unless the fangs are erected for battle, they lie concealed in the upper part of the mouth, sunk between the external and internal jaw bones, somewhat like a pen-knife blade shut up in its handle, where they are covered by a fold of membrane, which encloses them like a sheath; this is the *vagina dentis*. There can be no doubt but these fangs are frequently broken off or shed, as the head grows broader, to make room for new ones nearer the verge of the mouth; for, within the *vagina dentis* of a very large *crotalus horridus*, I found no less than five fangs on each side—in all stages of formation—the smallest in a half pulpy or cartilaginous state, the next something harder, the third still more perfect, and so on to the main, well-set, perfect fang. Each of these teeth had a well defined cavity like the main one. Three fangs on each side were frequently found in copper-heads, vipers, and others.

The process of robbing serpents of their venom is easily accomplished by the aid of chloroform, a few drops of which stupifies them. If, while they are under its influence, they are carefully seized by the neck, and the *vagina dentis* held out of the way by an assistant, with a pair of forceps, and the fang be erected and gently pressed upwards, the venom will be seen issuing from the fang, and dropping from its point. It may then be absorbed by a bit of sponge, or caught in a vial, or on the point of a lancet. After robbing several serpents in this manner, they were found after two days to be as highly charged as ever with venom of equal intensity with that first taken.

During the process of robbing several species of serpents, I inoculated several small but vigorous and perfectly healthy vegetables, with the point of a lancet well charged with venom. The next day they were withered and dead, looking as though they had been scathed with lightning. In attempting to preserve a few drops of venom, for future experiments, in a small vial with two or three parts of alcohol, it was found in a short time to have lost its venomous properties. But after mixing the venom with aqua ammonia, or spirits turpentine, or oil of peppermint, or of cinnamon, or of cloves, or with nitric or sulphuric acid, it still seemed to act with undiminished energy. It is best preserved, however, for future use by trituration with refined sugar or sugar of milk.

A very fine large cotton-mouth snake, being captured by put-

ting a shoe-string around him, became excessively ferocious, striking at even the crack of a small riding-whip. Finding himself a prisoner, without hope of escape, he turned his deadly weapons on his own body, striking repeatedly his well-charged fangs deeply into his flesh. Notwithstanding this, he was put in a small basket, and carried forward. In one hour after, he was found dead, and no amount of irritation could excite the least indication of life. Four hours after, while removing the skin for preservation, the blood oozed slowly from the vessels in a dissolved state. No violence was done to his snakeship, except what he did to himself.

Another moccasin, shot by a pistol about two inches back of the head, and skinned immediately, gave decided evidence of vitality four hours after being flayed, by wreathing the body whenever it was irritated by a scalpel.

A large rattle-snake beheaded instantly, with a hoe, would, an hour and a half after, strike at any thing that pinched its tail. Of several persons who were testing their firmness of nerve, by trying to hold the hand steady while the serpent struck at it, not one could be found whose hand would not recoil in spite of his resolution, and one man, a great bully, by-the-by, was struck on the naked throat with considerable violence by the headless trunk of the serpent, and staggered back, fainted and fell, from terror. Mr. Stewart, of Miss., tells me he witnessed a similar scene once. An old hunter shot a rattle snake's head off, and after reloading his gun and standing some time, he stooped to pull off the rattles, and the bloody but headless trunk of the snake struck him in the temple and he fainted and fell down with terror.

Seven venomous serpents belonging to five different species were made to fraternize and dwell amicably in one den. A beautiful pair of long bodied speckled snakes, known as king-snakes, and found to be fangless, and consequently without venom, were duly installed as members of the family. Some uneasiness was perceivable among the older members, but no attempt was made to destroy the intruders, though they might have been killed instanter. The next morning four of the venomous serpents were found to have been destroyed by the king-snakes, and one was still within their coil, and the two remaining ones would make no effort at self-defence. A large rattle-snake seemed stupid and indifferent to his fate. He could not be made to threaten or

give warning even with his rattles. The smallest king-snake was afterwards inoculated with the poison of one of the serpents he had destroyed, and died immediately after—thus evincing that they must have exercised some power besides physical force to overcome their fellow-creatures.

In short, the results of a great number of experiments performed with the venom of a great variety of serpents, seem to lead to the following conclusions :

1st. That the venom of all serpents acts as a poison in a similar manner.

2d. That the venom of some varieties is far more active than that of others.

3d. That a variety of the colluber, known as the cotton-mouth, is the most venomous serpent in Arkansas.

4th. That the venom of serpents destroys all forms of organized life, vegetable as well as animal.

5th. That alcohol, if brought in contact with the venom is, to a certain extent, an antidote.

6th. That serpents do possess the power of fascinating small animals, and that this power is identical with mesmerism.

7th. That the blood of small animals, destroyed by the venom of serpents, bears a close resemblance to that of animals destroyed by lightning or hydrocyanic acid; it loses its power of coagulation and cannot be long kept from putrefaction.—*St. Louis Med. and Surg. Jour.*, Jan. 1854.

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#### SYRUP OF ELDERBERRIES (SAMBUCUS CANADENSIS) AS A SUBSTITUTE FOR THE COMPOUND SYRUP OF SARSAPARILLA.

BY WILLIAM H. WORTHINGTON, M.D., of West Chester, Pa.

There being much dissatisfaction attending the use of the Compound Syrup of Sarsaparilla in the hands of some physicians, the Syrup of Elderberries was recommended to my notice by Dr. Benjamin H. Stratton, of Mount Holly, N. J., who for some years has been in the habit of using it in all cases of disease, in which an alterative action upon the system was desired, and for which the sarsaparilla is usually employed. In the treatment of gout, chronic rheumatism, eruptive and syphilitic affections, he has used it combined with the iodide of potas-

sium, with marked benefit. The formula used by him is the following:—

R.	Juice of Elderberries,	.	.	Oxvj.
	Sugar Crystal,	.	.	lbxvj.

Mix and boil to a syrup; after allowing it to cool, add to every pint of syrup one ounce of the best fourth proof French brandy, bottling and keeping in a cool place.

Dose, from a dessert to a table spoonful three times a day.

Flattering myself that an improvement could be made in the preparation of the above syrup without injury, I have prepared a compound syrup of elderberries, containing some, if not all of the most active ingredients of the compound syrup of sarsaparilla, (*Guaiaci lignum* and *Sennæ fol.*;) by this means, as I think, increasing the alterative virtues of the syrup, giving it a more marked and active character in the treatment of gout, rheumatism, &c., than it possessed without them. To this syrup may be added the iodide of potassium to suit the views of those prescribing. The formula is as follows:—

R.	Juice of Elderberries,	.	.	Oxvj.
	Sugar Crystal,	.	.	lb.xvj.
	Guaiacum wood,	.	.	℥iv.
	Senna leaves,	.	.	℥iii.

Put the sennæ fol. and the guaiac. lig. in three pints of water, boiling it down one-half, and strain. Put the juice and sugar in a kettle, place it on the fire, and when it has come to a boil, add the decoction of guaiac. lig. and sennæ fol., allow it to boil to a syrup, when it must be taken off strained and let cool. To every pint of syrup add one ounce of the best fourth proof French brandy, bottling and keeping in a cool place.

Dose, the same as preceding.

The syrup of elderberries is given to the profession chiefly upon the recommendation of Dr. Stratton, whose skill and experience as a practitioner is entitled to the confidence of his medical brethren. If, as he believes, it possesses more certain and prompt remedial virtues as an alterative than sarsaparilla, it ought to be added to our catalogue of officinal articles. The difficulty of obtaining at all times good sarsaparilla, and especially in the country, increases the claims of this syrup upon our rural practitioners, who can command with facility, and in great abundance, the material for its preparation.—*Medical Reporter.*



## FORMULA FOR STYPTIC BALSAM.

By JAMES WARREN, M. D.

It is nearly thirty years since I commenced the use of this balsam as a styptic, in the various forms of hemorrhage which are within the domain of medical pathology, and with uniform success. I am satisfied that no remedy now known exerts a more specific power and more speedy relief, especially in hemoptisis, hematemesis, epistaxis, and menorrhagia. It acts both by its sedative power, in diminishing the force of the circulation, and by its astringent qualities, in contact with the bleeding vessels. In the treatment of hemorrhage, neither bloodletting, confinement to the room, suppression of the voice, relaxation from business, nor other precautions are necessary; nor is any auxiliary treatment required, except, perhaps, a dose of Epsom salts, where there is evidence that blood has been swallowed.

Ordinary exercise in the open air is decidedly preferable to inaction; and wherever there are premonitory symptoms of a return of hemorrhage, it has always exerted a prophylactic power when promptly used; and by this early resort to the remedy, many radical cures have been effected.

The following is the formula and the method of using it:—

R.	Acid. Sulphuric. (by weight,) 3v.	
	Spts. Terebinth.	} f 5ij.
	Spts. Vin. Rect. aa.	

Place the acid in a Wedgewood mortar, and add the turpentine slowly, stirring it constantly with the pestle; then add the alcohol in the same manner, and continue stirring it until no more fumes arise, when it may be bottled, and should be stopped with a ground stopper. It should be prepared from the purest materials; and when done, it should exhibit a dark but clear red color, like dark blood; but if it be a pale, dirty red, it will be unfit for use. The dose is 40 drops, and the method of using it is as follows: Put a teaspoonful of brown sugar in a common-sized teacup, and rub in 40 drops of the balsam until it is thoroughly incorporated, and then slowly stir in water until the cup is nearly full, when it should be immediately swallowed. This dose may be repeated at intervals of an hour, until three or four doses are taken, if necessary; and its use should be discontinued

when fresh blood ceases to flow. After standing a few days, a pellicle forms upon the surface of the balsam, which should be broken, and the liquid below it used. It does not deteriorate by age, if tightly stopped.—*N. Y. Journal of Medicine*, from *N. Y. Med. Times*.

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#### NOTICE OF THE "CALIFORNIA NUTMEG."

By PROFESSOR J. TORREY, M.D.

About a year ago, I received from the late Mr. Shelton, who had just returned from San Francisco, a specimen of what was called the *California nutmeg*. I immediately considered it a species of Arnott's genus *Torreya*, belonging to the order *Taxineæ* of the great natural family of *Coniferæ*. It had been discovered but a year or two before Mr. Shelton left the country, and had already attracted considerable attention, not only from the beauty of the tree, but from the singular character of the fruit and kernel, the latter strongly resembling the common nutmeg. Indeed, it has been frequently stated in letters from California, that the nutmeg is a native of that country. The foliage has the form and deep rich green of the Florida species, or *T. taxifolia*, as well as of the yew; but the leaves are much larger, being from an inch and a half to two and a quarter inches long. They spread out on two sides, and are tipped with a sharp, rigid point. The fruit, as it may be popularly called, is about the size and form of a green gage plum, and in the dried state is of a pale olive color, but this may not be its natural tint. The outer covering is a thick, fleshy, nearly closed urceole, or dish, which completely invests the seed and closely adheres to it, except near the summit. It is smooth and even, and soft to the touch. The seed is usually oblong, and greatly resembles a large pecane nut, but frequently is more ovate. The shell is smooth, thin, and fragile. On each side, near the summit and just below the non-adhering portion of the dish, is a perforation, communicating with an interior canal, similar to what I described in *T. taxifolia*, and the use of which is still unknown. The kernel is conformed to the shell, and has the external and internal appearance of the nutmeg. When cut transversely the resemblance is perfect. The seed, however, is wholly destitute of

the delicate aromatic odor of the oriental spice, for it has the strong terebinthine character of the Coniferae. Neither is the fleshy covering of any known use. It is more probable that, like the fleshy cup-a-berry of the yew, it is of a poisonous nature. Still the discovery of this tree is interesting to the botanist and to the horticulturist. But two other species are known besides. One of them (*T. nucifera* Sieb. and Zucc.) is a native of Japan, and the other has only been found hitherto in Middle Florida, in very confined stations. The latter is erroneously stated by Zuccarini to have a seed as large as a walnut, by which he undoubtedly means the *Juglans regia*, or Madeira-nut, as it is called in the United States.

As an ornamental tree, the California nutmeg deserves to be extensively cultivated. It must be hardy, as it grows on the mountains, where the winter is very severe.

The enterprising Messrs. Parsons and Co., of Flushing, sent out a person to California for the express purpose of collecting the ornamental and useful plants of that country, and among other varieties, he obtained, last year, some ripe and fresh seeds of the Californian nutmeg. These germinated freely, and, when I saw the young plants last October, they had a healthy appearance, and had attained a good size. I have lately heard, also, that Mr. Lobb, an English collector, who has been exploring California for several years past, has sent seeds of this tree to England.

I close this notice with a short technical description of the new *Torrea*, which may be called *T. Californica*.

*T. foliis distichis, brevissime petiolatis, cuspidatis pungentibus subconcoloribus; floribus foemineis solitariis sessilibus; semilibus oblongis, disco carnosio clauso.*

Hab. Upper part of the Yuba and Feather Rivers, on the western slope of the Sierra Nevada of California.

Differs from *T. taxifolia* in the leaves being much larger, and not glaucous underneath, as well as being furnished with a sharper and more rigid point. The seed is longer, and the fleshy covering much thicker.

96 St. Mark's Place, February 3d, 1854.

[N. Y. Jour. of Pharm., Feb., 1854.]

## ON THE DRIED COFFEE-LEAF OF SUMATRA.

*Which is employed in that and some of the adjacent Islands as a substitute for Tea or for the Coffee-bean.*

By JOHN STENHOUSE, LL. D., F. R. S.

I recently received from my friend Daniel Hanbury, Esq., a quantity of dried coffee-leaves, which had been prepared in Sumatra, under the direction of N. M. Ward, Esq., of Padang.\* The sample had a deep brown color, and consisted of the leaves of the coffee-tree mixed with fragments of the stalks. The leaves had been very strongly roasted in rather a rough manner, and had consequently acquired a slightly empyreumatic odor. In this respect they pretty closely resemble Paraguay tea, the leaves and twigs of the *Ilex paraguayensis*, which is subjected to a somewhat similar process. The coffee-leaves, when digested with boiling water, yielded a deep brown infusion, which in taste and odor closely resembled an infusion of a mixture of coffee and tea. On the addition of milk and sugar, it formed a very tolerable beverage; and as the roasted coffee-leaf can be imported into Europe for rather less than twopence per pound, the poorer classes are likely to find it a very useful substitute for tea and coffee. Should a more moderate temperature be employed in drying the coffee-leaf, I think its flavor would be greatly improved.

The coffee-leaf, as might almost have been expected, contains the two characteristic constituents of the coffee-bean, viz., theine or caffeine, and caffeic acid. In this respect the coffee-leaf differs essentially from chicory or any of its adulterations, such as roasted turnips, mangelwurzel, carrots, &c., the usual substitutes for coffee, which do not contain a trace of either of these principles.

The theine or caffeine was extracted from the coffee-leaves in the usual way, by precipitating the coloring matter and other impurities, first by acetate and then by subacetate of lead. The acetate of lead threw down a dark brown precipitate containing all the caffeic acid, and the subacetate produced a scanty bright yellow precipitate. The excess of lead was then removed from the clear solution by sulphuretted hydrogen, and the sulphide of

\* See Vol. XXV, page 221 of this Journal.

lead having been collected by filtration, the theine crystallized when the liquid, after being sufficiently concentrated, had been set aside in a cool place for some days.

The crystals of theine as first obtained were of a brownish color, but after being strongly pressed between folds of blotting-paper and repeatedly crystallized, they were rendered nearly colorless.

I. 1000 grains of dried coffee-leaves, when treated in the way just described, yielded 12.5 grains theine = 1.25 per cent.

II. 1000 grains of coffee-leaves in a subsequent trial, gave 11.54 grains = 1.15 per cent.

The amount of nitrogen in the dried coffee-leaves was also determined by Will's method.

1.344 grm. substance gave 0.2005 platinum = 2.118 per cent. nitrogen.

0.7775 grm. gave 0.1185 platinum = 2.165 per cent.

Now it has been ascertained as the result of numerous experiments,\* that "coffee contains from 0.80 to 1 per cent. of theine, and that tea contains 1 per cent. of the same principle." "And the nitrogen in coffee-beans (see page 27 of the same Report) lies between  $2\frac{1}{2}$  and 3 per cent."

By a recent determination I found that 1000 grains of a good black tea gave 21.3 grains of theine = 2.13 per cent.

1000 grains of a black tea grown in the East India Company's tea plantations at Kemaon, on the Himalayas, gave 19.7 grains = 1.97 per cent.

0.4705 grm. of the same Kemaon tea gave 0.1175 platinum = 3.5 per cent. nitrogen.

Many years ago I detected the existence of theine in what is called Paraguay tea, the dried leaves and twigs of the *Ilex paraguayensis*, but I neglected to determine its amount. I have recently found that 1000 grains of Paraguay tea yielded 12.3 grains of theine = 1.23 per cent.

III. 1000 grains ditto gave 11 grains = 1.1 per cent.

1.748 grm. gave 0.1865 platinum = 1.51 nitrogen.

\* See the 32nd page of the "Chemical Report on the Mode of Detecting Vegetable Substances mixed with Coffee, for the purposes of adulteration," drawn up by Professor Graham, Dugald Campbell, Esq., and myself, for the British Government, and communicated to it in December, 1852.

1.031 grm. gave 0.153 platinum = 1.70 nitrogen per cent.

From these results it is clear that dried coffee-leaves are somewhat richer in theine than the coffee-bean, and contain, as nearly as may be, the same amount of that principle as Paraguay tea.

From the violent roasting to which the coffee-leaves had been subjected, I feel convinced a portion of their theine has been dissipated; and were they only dried at a moderate temperature, I confidently expect that they would yield  $1\frac{1}{2}$  per cent. of theine. The theine obtained from the coffee-leaves was not subjected to analysis. This I considered unnecessary, as it possessed all the well-known properties of ordinary theine, crystallizing in fine silky crystals, which readily sublimed when heated; and when digested with nitric acid and cautiously evaporated to dryness, they gave when treated with ammonia the characteristic red coloration so closely resembling that from uric acid when acted on by the same reagents.

With regard to caffeic acid, the other characteristic proximate principle of coffee, the leaf of the coffee plant contains it also in larger quantity than the berry. Caffeic acid is precipitated of a deep yellow color by acetate of lead, but is apparently uncrystallizable; at least the numerous attempts which I have made to obtain it in a crystallizable state have hitherto proved unsuccessful. Caffeic acid does not precipitate solutions of gelatine, and it is therefore not a species of tannin, as has been sometimes asserted. The most remarkable property of caffeic acid is that first stated at the 34th page of the joint Report on the adulteration of coffee already quoted. "Caffeic acid appears to be analogous to kinic acid, the acid of cinchona barks, for it yields kinone when oxidated by means of sulphuric acid and binoxide of manganese. To observe this properly, the coffee is boiled with water and a little slaked lime, the infusion filtered and evaporated down to the consistence of a syrup. The syrupy liquid is then mixed in a retort with four times its weight of binoxide of manganese, and one part of oil of vitriol diluted with an equal bulk of water. Sufficient heat is produced by the action of the sulphuric acid upon the other materials to bring over the greater portion of the kinone, and the lamp need not be applied till towards the close of the operation. The distillate consists of yellow crystals of kinone, which usually coat the neck and sides of the retort, and a bright yellow liquid, which is a saturated aqueous solution of kinone,

with a considerable quantity of formic acid. Kinone is easily discernible by its volatility and peculiarly acrid odor, which greatly resembles that of chlorine. The solution of kinone gives with ammonia a sepia black color. It is decolorized by sulphurous acid. The beautiful green hydrokinone is obtained by exactly neutralizing the solution of the yellow kinone with sulphurous acid, great care being taken not to introduce the latter in excess.

“The peculiar acid in Paraguay tea agrees with caffeic acid, to which it is no doubt related, in yielding kinone to similar oxidizing agencies; so does the acid of the leaves of the common holly, *Ilex aquifolium*, and the whole of the cinchona tribe.”

When coffee-leaves are boiled with a considerable quantity of water, and a slight excess of milk of lime, the dark brown strongly alkaline liquor is cautiously evaporated to dryness, and then treated in the way already described, with three times its weight of black oxide of manganese and one part of sulphuric acid, diluted with its own bulk of water, a much larger quantity of crystals of kinone are obtained than can be procured from an equal weight of the coffee-bean. This clearly shows that the leaves are richer in caffeic acid than the beans.

Kinone may, I find, be obtained in small quantity by a similar process from a great number of our commonest plants. Thus I also obtained indications of kinone from the leaves and branches of the privet, *Ligustrum vulgare*; from the common ivy, *Hedera helix*, from the *Quercus Ilex*, the evergreen oak of our gardens and shrubberies, a native of Turkey; from the *Quercus robur*, the common British oak; from the *Ulmus campestris*, the common small-leaved elm; from the ash, *Fraxinus excelsior*; and from the bush-tea of the Cape of Good Hope, the *Cyclopia latifolia* of De Candolle, a plant of the natural order Leguminosæ.

From numerous plants which I tried, I could not obtain a trace of kinone. This was the case among others with laburnum, *Cytisus laburnum*, with tobacco, with *Prunus spinosa*, the sloe, and others too numerous to mention.

The kinone was only obtained in crystals from the coffee-bean, from the coffee-leaf, and from the holly, *Ilex aquifolium*. In all the other cases, its existence was detected by the deep yellow liquid which distilled over at a comparatively low temperature, and which yielded the dark humus-like coloration with ammonia,



so characteristic of solutions of kinone. Kinone is so exceedingly soluble in water, that unless a considerable amount of it is evolved, and proper precautions are employed, a deep-colored solution of it only is obtained, either from the coffee-leaf, the berry or the leaves of the holly. The comparatively small amount of the kinone yielding substance, or perhaps we should say substances, present in such plants as the privet, the oak, &c., is most probably the only reason why crystals of kinone have not likewise been obtained from these plants.

In order to assist in forming an estimate of the comparative value of coffee-leaves as a beverage as compared with the bean, I determined the amount of soluble matter which each of them yielded to boiling water. 6.048 grms. of dried coffee-leaves and 6.038 grms. of roasted and ground coffee-beans were repeatedly treated with precisely similar quantities of boiling water, till the liquid which came off from them was nearly colorless. The 6.048 grms. coffee leaves were found to have lost 2.348 grms. = 38.8 per cent., while the 6.038 grms. roasted coffee-beans had lost 1.759 grms. = 29.1 per cent. From this determination it is clear that coffee-leaves yield to boiling water near 10 per cent. more soluble matter than the bean. In this respect, therefore, the coffee-leaf has an advantage over the berry.

So far as regards the two characteristic principles of coffee, viz., caffeic acid and theine or caffeine, these are common both to the leaf and to the bean, the leaf being decidedly rich in both. In other respects, however, they differ considerably. The coffee-leaf contains some tannin, and scarcely any sugar or fat. The coffee-bean contains about 12 per cent. of fat and "8 per cent. of cane-sugar." (See Joint Report.)

So far as I can judge, the infusion of the coffee-leaf has a much greater resemblance to that of tea than to a decoction of the coffee-bean; so that should the coffee-leaf ever come into general use in European countries, it will be rather as a substitute for tea than for coffee. If the coffee-leaves were only dried at a somewhat lower and better regulated temperature, I have little doubt that they would yield a much more agreeable beverage than can be made with the present roughly-roasted and partially empyreumatized product.—*Lond. Pharm. Jour. Feb. 1854, from Philosophical Magazine.*

THE USE OF COFFEE AS A BEVERAGE CONSIDERED IN A  
CHEMICAL AND PHYSIOLOGICAL POINT OF VIEW.

By PROFESSOR LEHMANN.

In the experimental consideration of this subject the author has adopted as a principle, that under a well regulated and uniform diet and mode of life, the quantitative relations of the substances excreted in the urine, present a trustworthy view of the general assimilative process in the individual.

He has therefore selected patients whom he considered fit, and while administering to them either coffee or its various constituents separately, has made such regular observations of the urinal excretions as would enable him to infer what is the nature of the efficacy of coffee and of its constituents respectively.

In determining the amount of urea, he has adopted the method recently put forward by Liebig.

The general results of his investigation are :

1. That a decoction of coffee exercises two principal actions upon the organism, which are very diverse in character, viz., increasing the activity of the vascular and nervous system, while at the same time it retards the metamorphosis of plastic constituents.

2. That the influence of coffee upon the vascular and nervous system, its re-invigorating action, and the production of a general sense of cheerfulness and animation is attributable solely to the mutual modification in the specific action of the empyreumatic oil and the caffeine contained in it.

3. That the retardation of the assimilative process brought about by the use of coffee, is owing chiefly to the empyreumatic oil, and is caused by caffeine only when taken in large quantity.

4. That increased action of the heart, trembling, headache, &c., are effects of the caffeine.

5. That the increased activity of the kidneys, relaxation of the bowels, and an increased vigor of mental faculties, passing into congestion, restlessness, and inability to sleep, are effects of the empyreumatic oil.

Professor Lehmann considers it therefore necessary to regard the action of coffee, and in a less degree that of tea, cocoa, alcohol, &c., upon the organism, as constituting an exception to the gen-

eral law, that increased bodily and mental activity involves increased consumption of plastic material.

He considers that these substances have the capability of rendering the individual insensible of a certain deficiency of food in virtue of their retardation of the assimilative process.

He thinks it probable, likewise, that these substances have a direct nutritive value, especially coffee as drank by the Turks and Arabs with the grounds.

He attributes the rapid increase in the consumption of coffee to an instinctive tendency to provide some remedy for the compulsory use of the potato as food among the lower classes; and in confirmation of this, points to the facts, that the introduction of the potato from the west, and that of coffee (as an article of food) from the east, were simultaneous, and that the increase in their consumption has progressed equally, both as regards amount and locality.

Professor Lehmann considers that the singular preference of one or other of these beverages by particular nations, as well as the eastern custom of drinking coffee with the grounds, are not accidental, but have some deeper reason. This reason he thinks is to be found in the different effects of the coffee, tea, &c., and the various requirements of the nations by whom they are used, and instances the use of tea by the English, and of coffee by the Germans and French, as in accordance with this view. The diet of the former affords a larger supply of plastic material than that of the latter people, and while, consequently, the retardation of the assimilative process is an important influence for the German, the proportionately greater nervous stimulus caused by tea is more desirable for the former.

The use of coffee with its grounds, has its analogue in the use of tea mixed with meal, milk, and butter among the Mongols, and other inhabitants of the central Asiatic steppes.—*London Pharm. Jour.*, Feb. 1854, from *Annalen der Chemie und Pharmacie*, September, 1853.

## REMARKS ON SARSAPARILLA.

By DR. BERTHOLD SEEMAN.

At a meeting of the Linnean Society, held December 6th, a paper was read by Dr. Seeman on the above subject, of which the following abstract is given in the *Gardener's Chronicle*:—

“In this interesting memoir, Dr. Seeman stated, as the conclusions at which he had arrived, after a careful investigation of the subject, that the greater proportion of Sarsaparilla imported under the commercial names of ‘Jamaica,’ ‘Lisbon,’ or ‘Brazilian,’ and ‘Guatemala’ or ‘Red Paraguay’ Sarsaparilla, is the produce of one species only, and that the *Smilax officinalis* of Humboldt and Bonpland; and further that the *S. medica* of Schlechtendal and Chamisso, and the *S. papyracea* of Poiret, are identical with it. *Smilax officinalis* grows in the lower coast region as well as on the mountains to an elevation of 5000 feet above the sea, and is confined, as far as is known, to the South American continent between the 20th degree of N. lat. and the 6th degree of S. lat., and the 110th and 40th degrees of West longitude. The article known as Jamaica Sarsaparilla is imported into that island from the Spanish Main. The roots, which form the commercial article, abound more or less in starch, according to the age and conditions under which they have grown. The stem is quadrangular and prickly, the branches also quadrangular or multiangular, and with or without prickles, the petioles sheathing at the base, and having a pair of tendrils, the leaves very variable, broadly cordate, almost three-lobed, gradually acuminate or ovate-oblong, or even lanceolate, and rounded at the apex, but always mucronate, generally five-nerved, and prickly on the nerves beneath, varying in length from two inches to one foot, and in texture from coriaceous to papery; the flowers, which grow in little umbels of about sixteen together, are unknown, but the berries are round, red, and the size of a cherry. Dr. Seeman further remarks, that while botanists competent to judge of the question are not likely to raise any objection to his uniting these three supposed species, pharmacologists are less likely to be convinced on this point, except on the strongest evidence, the appearance of the commercial samples being so different; the Lisbon Sarsaparilla, which comes in rolls about three feet long, having fewer rootlets or beards than that termed Jamaica Sarsaparilla.

This difference, however, was stated to be clearly the result of the rootlets having been removed by some mechanical means or other, before the article reaches the market. The condition indicated by the chief pharmacological distinction into 'mealy' and 'non-mealy' samples, he believes to depend on the age of the roots, and on the locality in which they are collected. While, however, the botanical source of the various Sarsaparillas was thus held to be identical, the value of the commercial distinctions, as such, was admitted; for 'as long as the Brazilian collectors continue to strip the roots of their beard and put them up in long bundles, there will always be Lisbon Sarsaparilla; as long as the inhabitants of the Spanish Main continue to preserve the rootlets we shall have Jamaica Sarsaparilla; and as long as the climate and other physical conditions of Guatemala remain unchanged, we shall continue to receive from that locality Sarsaparilla distinguished by its abundance of starchy matter.'—*Lond. Pharm. Jour.*, Feb. 1854.

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#### ON THE COLLECTION AND PREPARATION OF CAOUTCHOUC IN BRAZIL.

The following account of the collection of Caoutchouc, which is called *Seringa*, and the collectors of it *Seringeros*, is taken from Herndon's Exploration of the Amazon.

"The owner of the house told me that the season for gathering the rubber or *Seringa*, as it is called here, was from July to January. The tree gives equally well at all times; but the work cannot be prosecuted when the river is full, as the whole country is then under water. Some, however, is made at this time, for I saw a quantity of it in this man's house, which was evidently freshly made.

The process of making it is as follows: a longitudinal gash is made in the bark of the tree with a very narrow hatchet or tomahawk; a wedge of wood is inserted to keep the gash open, and a small clay cup is stuck to the tree beneath the gash. The cups may be stuck as close together as possible around the tree. In four or five hours the milk has ceased to run, and each wound has given from three to five tablespoonfuls. The gatherer then collects it from the cups, takes it to his rancho, pours it into an earthen vessel, and commences the operation of forming it into

shapes and smoking it. This must be done at once, as the milk soon coagulates.

A fire is made on the ground of the seeds of nuts of a palm tree, of which there are two kinds; one called Urucari, the size of a pidgeon's egg, though longer; and the other Inaja, which is smaller. An earthen pot with the bottom knocked out, is placed, mouth down, over the fire, and a strong pungent smoke from the burning seed comes up through the aperture in the bottom of the inverted pot.

The maker of rubber now takes his last, if he is making shoes, or his mould, which is fastened to the end of a stick, pours the milk over it with a cup, and passes it slowly several times through the smoke till it is dry. Moulds are made either of clay or wood; if of wood, it is smeared with clay to prevent the adhesion of the milk. When the rubber has the required thickness, the moulds are either cut out or washed out. Smoking changes the color of the rubber very little. After it is prepared, it is nearly as white as milk, and gets its color from age.

The most common form of the India rubber of commerce is that of a thick bottle; though it is also frequently made in thick sheets, by pouring the milk over a wooden mould shaped like a spade, and when it has a coating sufficiently thick, passing a knife around three sides of it, and taking out the mould. I should think this the least troublesome form, and most convenient for transportation.

From 20 to 40 coats make a pair of shoes. The soles and heels are of course given more coats than the body of the shoe. The figures on the shoes are made by tracing them on the rubber whilst soft, with a coarse needle or a bit of wire. In a week the shoes are taken from the last. The coating occupies about 25 minutes. An industrious man is able to make about sixteen pounds of rubber a day; but the collectors are not industrious. I heard a gentleman in Para, say they rarely average more than three or four lbs.

The tree is tall, straight, and has a smooth bark. It sometimes reaches a diameter of eighteen inches or more. Each incision makes a rough wound on the tree, which, although it does not kill it, renders it useless, because a smooth place is required to attach the cups. The milk is white and tasteless, and may be taken into the stomach with impunity.

The rubber is frequently much adulterated by the addition of tapioca or sand, to increase its weight ; and unless care is taken in its manufacture, it will have many cells containing air and water. Water is seen to exude from nearly all of it when cut, which is always done for the purpose of examination before purchase. I brought home some specimens, that were more than half mud." Pages 330 and 331.

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IDENTITY OF DYNAMIC OR VOLTAIC ELECTRICITY WITH  
STATIC OR FRICTIONAL ELECTRICITY.

By PROFESSOR FARADAY.\*

The Friday evening meetings for the season commenced at the Royal Institution on Friday last, the opening lecture being delivered by Professor Faraday to a very crowded audience. The subject was the developement of electrical principles produced by the working of the electric telegraph. To illustrate the subject, there was an extensive apparatus of voltaic batteries, consisting of 450 pairs of plates, supplied by the Electric Telegraph Company, and eight miles of wire, covered with gutta percha, four miles of which in coils were immersed in tubs of water, to show the effects of submersion on the conducting properties of the wire in submarine operations. The principal point which Professor Faraday was anxious to illustrate, was the confirmation which experiments on the large scale of the electric telegraph have afforded of *the identity of dynamic or voltaic electricity with static or frictional electricity*. In the first place, however, he exemplified the distinction between conductors and non-conductors, impressing strongly on the audience that no known substance is either a perfect conductor of electricity or a perfect non-conductor, the most perfect known insulator transmitting some portion of the electric fluid, whilst metals, the best conductors, offer considerable resistance to its transmission. Thus the copper wire of the submarine electric telegraph, though covered with a thickness of gutta percha double the diameter of the wire, permit an appreciable quantity of the electricity transmitted to escape through the water ; but the insulation is, nevertheless, so good

\* From the London Mechanics' Magazine, January 7.



that the wire retains a charge for more than half an hour after connexion with the voltaic battery has been broken. Professor Faraday stated that he had witnessed this effect at the Gutta Percha Works, where one hundred miles of wire were immersed in the canal. After communication with a voltaic battery of great intensity, the wire became charged with electricity, *in the same manner as a Leyden jar*, and he received a succession of forty small shocks from the wire, after it had been charged and the connexion with the battery broken. No such effect takes place when the coils of wire are suspended in the air, because in the latter case there is no external conducting substance. The storing-up of the electricity in the wire when immersed in water is exactly similar to the retention of electricity in a Leyden jar, and the phenomena exhibited correspond exactly with those of static electricity, proved in this manner, as had previously been proved by charging a Leyden jar with a voltaic battery, that dynamic and static electricity are only different conditions of the same force; one being great in quantity, but of low intensity, whilst the latter is small in quantity, but of great intensity. Some interesting facts connected with the conduction of electricity have also been disclosed by the working of the submarine telegraph, which Professor Faraday said confirmed the opinion he had expressed twenty years ago, that the conducting power of bodies varies under different circumstances. In the original experiments by Professor Wheatstone, to ascertain the rapidity with which electricity is transmitted along copper wire, it was found that an electric spark passed through a space of 280,000 miles in a second. Subsequent experiments with telegraph wires have given different results, not arising from inaccuracy in the experiments, but from conditions of the conducting wires. It has been determined that the velocity of transmission through iron wire is 16,000 miles in a second, whilst it does not exceed 2700 miles in the same space of time in the telegraph wire between London and Brussels, a great portion of which is submerged in the German Ocean. The retardation of the force in its passage through insulated wire immersed in water is calculated to have an important practical bearing in effecting a telegraphic communication with America; for it was stated that, in a length of 2000 miles, three or more waves of electric force might be transmitting at the same time, and that if the current be reversed, a signal sent

through the wire might be recalled before it arrived at America. Professor Faraday concluded by exhibiting a beautiful experiment illustrative of the identity of voltaic and frictional electricity. The terminal wires of a powerful secondary-coil apparatus were placed seven inches apart within the receiver of an air pump, and when the receiver was exhausted, a stream of purple colored light passed between the wires, resembling, though more continuous and brilliant, the imitation of the aurora borealis produced when an electric spark is passed through an exhausted glass tube. The voltaic power employed to produce this effect of static electricity was only three cells of a Grove's battery.—*Frank. Inst. Jour. April, 1854.*

## RESEARCHES ON EVAPORATION.

By PROFESSOR MARCET, of Geneva.

The following experiments were instituted with the view of throwing some light on the tendency of certain circumstances to promote or diminish the evaporation of liquids. Water and alcohol were the liquids chiefly used. The results obtained by the author may be recapitulated as follows:—

1. The temperature of a liquid, allowed to evaporate freely in an open vessel, is always inferior to that of the surrounding atmosphere. The higher the temperature of the atmosphere, the greater is the difference between its temperature and that of the liquid exposed to evaporation. Between  $40^{\circ}$  and  $50^{\circ}$  Centigrade, the difference was found to vary from  $5^{\circ}$  to  $7^{\circ}$ ; between  $20^{\circ}$  and  $25^{\circ}$  it varied from  $1\frac{1}{2}^{\circ}$  to  $1\frac{1}{4}^{\circ}$ ; at  $12^{\circ}$  it was  $0.8^{\circ}$  only, and between  $3^{\circ}$  and zero about  $0.2^{\circ}$ . The explanation of this result is obvious. The evaporation of a liquid diminishing with the external temperature, the cold, which is the consequence of this evaporation, must diminish in the same proportion; and if it were possible to prevent evaporation altogether, the author presumes that there would be no difference whatever between the temperature of a liquid and that of a surrounding medium.

2. The temperature of liquids, such as water and alcohol, as well as the rapidity with which they evaporate, varies, all other circumstances remaining the same, according to the nature of the vessel in which these liquids are contained. For instance, the temperature of the surrounding atmosphere being from  $15^{\circ}$  to

20°, water is, on the average, 0.3° warmer in an open metallic vessel than in a similar one of polished porcelain, and 0.2° warmer than in a similar one of glass. It is the same with alcohol. Again, both water and alcohol evaporate more rapidly from a porcelain vessel than from a metallic or glass vessel of precisely the same size. For example—three similar vessels, one of metal, the second of porcelain, and the third of glass, containing each 600 grains of water, having been exposed to evaporation during seven days, the temperature of the surrounding atmosphere varying from 20° to 25°, it was found, that at the end of that time, the porcelain vessel had lost 303 grains of its previous weight; the metallic one 277, and the glass vessel 275.5 grains only. The author enters into considerable detail as to the precautions he took to make sure that these differences could not be attributed to any difference in the radiating or conducting powers of the vessels employed.

The differences observed in the temperature of liquids, according to the nature of the vessels in which they are contained, depends, no doubt, on the property with which these vessels appear to be endowed, of accelerating or delaying evaporation. It is evident, that in each case the quantity of sensible heat subtracted from the liquid, or, in other words, the diminution of its temperature, must be in proportion to the quantity of vapor formed. For instance, the fact that water and alcohol are constantly colder in a porcelain vessel than in a similar vessel of metal or glass, is the natural result of the more rapid evaporation of these liquids from the former of these vessels than from the two latter. The reason why a porcelain vessel evaporates more freely than a metallic or glass one is far less evident. The author has proved, by placing a hermetically-closed bottle of porcelain, containing water, under the vacuum of the air pump, that it cannot be owing to any perviousness of the sides of the vessel, as he was at first inclined to suspect.

3. The influence of the mass or depth of a liquid was next examined. The author's experiments appear to lead to the curious fact, that the rapidity with which any given liquor evaporates depends not only on the extent of its surface, but also, within certain limits, on its depth. He found, for instance, that with two similar cylindrical porcelain vessels, containing, the first a

layer of water of one-twelfth of an inch in depth, and the second a layer of half an inch, the evaporation from the latter exceeded that of the former in the proportion of nearly 4 to 3. A similar result was obtained with alcohol. If thin glass vessels were used, the same increase of depth accelerated the evaporation in the proportion of 6 to 5. As the author himself observes, this apparent influence of the depth of a liquid on its evaporation, may, very possibly, be merely owing to the greater facility with which the different layers are conveyed, one after the other, to the surface, when the liquid is of a certain depth than when it is quite shallow.

4. Water containing a solution of salt in about the same proportion of sea water, evaporates less rapidly, and, consequently, produces less cold than the same quantity of distilled water. The higher the temperature of the surrounding atmosphere, the greater the difference between the quantities of salt and fresh water evaporated in a given time, under similar circumstances.

5. A given quantity of water, mixed with certain pulverulent substances, such as a siliceous sand, for the particles of which it has but a slight adhesion, evaporates more rapidly than the same quantity of distilled water *alone*. The fact was ascertained in the following manner:—The author, having procured two small porcelain vessels, exactly of the same size, introduced into one of them 300 grains of distilled water, and into the other a small quantity of siliceous sand, over which 300 grains of water were poured, so as not only to saturate the sand, but also to leave a layer of water of about one-tenth of an inch in thickness over and above its surface. At the end of five days, it was observed that the water standing alone had lost 184 grains of its previous weight, while the water mixed with the sand had lost no less than 196 grains. The average difference, resulting from a series of experiments, was  $7\frac{1}{2}$  per cent. in favor of the more rapid evaporation of water mixed with sand compared with that of water standing alone. If the experiment be made with glass or metallic vessels, the difference is only about  $4\frac{1}{2}$  per cent.

6. The last result we shall mention, and which may be regarded as a direct consequence of the preceding one, is the following:—Water mixed with sand remains habitually at a slightly lower temperature than an equal surface of water standing alone. The difference varies to a certain extent, according to the nature of

the vessels in which the experiment is performed, never, however, exceeding half a degree Centigrade. It is greater when the comparison is made between water and wet sand placed in two similar metallic vessels, than when they are placed in porcelain or glass vessels; in the latter case it seldom exceeds  $0.1^{\circ}$  to  $0.2^{\circ}$ .

The author concludes by remarking, that the foregoing result tends to confirm an opinion expressed some time since by Professor De la Rive, in a letter to M. Arago, published in the *Comptes Rendus de l'Académie des Sciences* for October, 1851. In this letter, M. De la Rive attributes the sudden appearance of vast glaciers in divers part of Europe to a temporary refrigeration produced at the period of the elevation of the most recent European strata, by the evaporation of the water with which they were previously covered. If, as the author's experiments tend to show, evaporation takes place more rapidly from water mixed with sand, earth, or any similar substance than from a surface of clear water, it becomes natural to conclude, that the cold produced by evaporation from the recently-elevated and still humid strata, must have been greater than that resulting from the evaporation of the sea or fresh water lake which covered them previously to a great depth.—*Bibliothèque Universelle, April, 1853., from Frank. Inst. Jour. and Repert. of Pat. Inv.*

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## THE ACCELERATION OF THE DRYING OF OILS BY METALLIC SALTS.

BY BARRUEL AND JEAN.

According to the researches of Berthollet and Saussure, the drying oils do not absorb considerably, for a long time, oxygen from the air; but suddenly follows, after this inactivity, a rapid and almost violent reaction, which may be recognised by a considerable evolution of carbonic acid without a noticeable formation of water, and at the same time the oil dries with an increase of weight.

First of all, we found that an oil which contained no drying oil or any other drying agent, began after five or six days to evolve carbonic acid. In contrary instances, the evolution of carbonic acid commenced after eight or ten hours' contact with the air.

A very important fact which has arisen from our experiments is, that if the internal motion shall manifest itself in a distinct manner, a medium temperature from  $50^{\circ}$  to  $59^{\circ}$  Fahr. must exist, while under this degree of heat to  $32^{\circ}$  the action of the inciting or promoting body is always weaker. The necessity of a moderate temperature points out the analogy of this phenomenon to fermentation. We may remark here that the increase of weight of a layer on tin, after it was completely dry, amounted to 16 per cent. of the weight of the oil employed.

Farther, our experiments have shown that the direct or reflected light of the sun had a remarkable influence on the phenomena accompanying the drying of the oil. Thus, a surface of tin on which a film was painted, consisting of 69 grammes of oil boiled with black oxide of manganese and zinc-white, had taken up, after seven hours, in a dark place, only about 1.1 gramme; after twenty-four hours, the increase amounted to 2.23 grammes; while a similar surface exposed in a laboratory, at the same temperature, to the light of the bright sky, had taken up in seven hours about 3.33 grammes, and after twenty-four hours about 4.42 grammes. Under the direct influence of sunlight, the absorption is still more rapid than in the foregoing cases. In an experiment of twenty-four hours' duration, a similar surface covered with 35 grammes of zinc-white paint, with drying ingredients, had taken up about 4 grammes, and evolved .345 grammes of water, and 1 gramme of carbonic acid. The water obtained appeared to arise from the entire surface of the glass vessel employed for the experiment, and according to various weighings it was not proportional to the evolved carbonic acid. From the above, it seems that the absorption of the oxygen by drying oils, under the influence of light and heat, is the consequence of an internal impulse, which acts in the way of a ferment.

These, our new views, were established by a large number of facts, for we found bodies which, under the influence of light and a moderate temperature, in extremely small quantities, and in a very short time, effected the drying of the oil, or rather converted it into resin, by which carbonic acid was evolved and the oxygen of the air assimilated. There is, therefore, in our opinion, an oil fermentation analogous to the lactic acid fermentation.



In the manufacture of fatty drying oils, the oxides taken up by them are not completely reduced, by which, as we have convinced ourselves, carbonic acid is generated: the reduced oxide is thereby converted into a body, which acts on the oil like a ferment; the conclusion is, therefore, that boiled linseed oil has in no way drying properties when it contains no dissolved oxide. We found that the bodies which possess this inciting power in the greatest degree, are most protoxides of the metals Mn, Zn, Fe, Sn, Co, Cd, and among these the protoxides of cobalt and manganese afforded us the most satisfactory results. In some cases the protoxide of iron behaved in a similar manner, however less powerfully.

To find a ferment or siccative which acts rapidly without injury on the drying oils, we must consequently seek for compounds of the above-mentioned oxides, which are readily to be prepared on a large scale, and which allow these oxides to exercise their properties on the oil. This is not the case with the above-mentioned oxides when they are difficult to prepare, and cannot be preserved in contact with the air.

We directed our attention, therefore, in the first place to the inorganic and organic compounds of cobalt and manganese. We found that carbonic, phosphoric, sulphuric, nitric, and muriatic acids, as well as most organic acids, retained their oxides too firmly and almost destroyed their action. The salts of these acids in a basic condition have a distinct influence.

But of all inorganic acids, boracic acid is that which afforded the most satisfactory results in combination with the protoxide of cobalt and manganese. The proportion of borate of manganese, which suffices to induce fermentation in a drying oil, is from 1 to  $1\frac{1}{2}$  thousandth part of the weight of the oil.

We may remark that the borate of manganese which we employ, and with the study of which we are now engaged, is not an anhydrous salt, but contains 25 per cent. of water. It seems to us to act in the following manner:—A portion of the protoxide is separated under the influence of light and heat, it absorbs the oxygen of the air to form the proto-peroxide, and then it is noticed that the oil begins to become adhesive. It is also remarkable, that the film at this moment acquires a color which disappears when the film is dry. If 1 to 2 per cent. of borate of



manganese is added to the oil, the brown coloration of the oil remains.

Two organic acids afforded us, with the protoxide of cobalt and manganese, salts analogous to that of the borate, namely, benzoic and hippuric acids. The resulting resins behave themselves as weak acids.

The rapid action of the borate of manganese, and the coloration which it communicates to the film, do not produce any bad results if, in its preparation, a certain quantity of some serviceable substance is mixed with the paint. This completely obviates this disadvantage, and renders the drying material not injurious. *Annals of Pharmacy*, from *Moniteur Industriel*.

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#### EXAMINATION OF THE CRYSTALLINE DEPOSIT WHICH FORMS IN OIL OF BITTER ALMONDS.

By JOHN STENHOUSE, LL.D., F. R. S.

When oil of bitter almonds is kept for some time in loosely-stoppered bottles, a crystalline deposit not unfrequently forms in it, especially if the oil is exposed to the influence of the light. So long ago as 1823, M. Stange declared this crystalline deposit to be simply benzoic acid produced by the oxidation of the oil, a statement which was confirmed in 1830 by Robiquet and Boutron-Challard. (*Ann. de Chim. et de Phys.*, vol. xliv., p. 364.) It does not appear, however, that any of these chemists subjected the supposed benzoic acid to the test of analysis. Subsequently the late Dr. Jonathan Pereira, in the first edition of his *Elements of Materia Medica*, p. 1107, stated that he had met with "three kinds of a crystalline substance from oil of bitter almonds, differing essentially from each other and from benzoic acid." These deposits were examined by Dr. Pereira, and one of them, that marked No. 3, by Dr. Letheby. None of them were subjected to analysis, but they were tested by the action upon them of oil of vitriol, caustic potassa, &c. These crystalline deposits were given to Dr. Pereira by Mr. George Whipple, who kindly furnished me a few weeks ago with no fewer than ten different specimens of a similar character which had formed in as many portions of oil of bitter almonds. The weight of the crystals exceeded three ounces.

The crystals had a deep yellow color, and were strongly impregnated with oil of bitter almonds. As much of the oil as possible was removed by strongly compressing the crystals between folds of blotting-paper. The crystals were then digested with boiling water, in which they readily dissolved. After repeated solutions and crystallizations, they presented the usual characters of benzoic acid. On analysis, 0.4215 grm. substance dried at  $212^{\circ}$  F., when burnt in a current of oxygen gas, gave 1.069 carbonic acid and 0.2005 water =

	Calculated numbers.	Found numbers.
14 C. . .	68.853 . .	69.167
6 H. . .	4.915 . .	5.283
4 O. . .	26.232 . .	25.460
	<hr/>	<hr/>
	100.000	100.000

The silver salt was prepared by neutralizing the acid with ammonia, and then adding a solution of nitrate of silver. When subjected to analysis, 0.3883 grm. salt gave 0.525 carbonic acid and 0.317 water.

1.1711 grm. salt gave 0.5516 silver.

	Calculated numbers.	Found numbers.
AgO. . .	50.654 . .	50.533
14 C. . .	36.684 . .	36.909
5 H. . .	2.183 . .	2.317
3 O. . .	10.479 . .	10.241
	<hr/>	<hr/>
	100.000	100.000

From these results it is clear that the crystalline deposits from oil of bitter almonds examined by me were simply benzoic acid, and this I have reason to believe was also the case with two out of three samples described by Dr. Pereira; for through the kindness of Professor Redwood, I obtained three small specimens of these deposits from Dr. Pereira's collection, now in the possession of the Pharmaceutical Society. That marked No. 1, I found to be simply benzoic acid. I received also a specimen given to the Pharmaceutical Society by Mr. Whipple; it was also benzoic acid. The specimen marked No. 3, and which amounted only to a few grains in weight, was that examined by Drs. Pereira and Letheby. It consisted of small, acicular, lemon-yellow crystals,

which were insoluble in water, alcohol, ether, and acetic acid. Sulphuric acid reddened and then dissolved them, forming a deep yellow solution. They were not dissolved by a solution of caustic potassa in the cold; when heated with it, however, ammonia was evolved, which proved that the crystals contained nitrogen. When the crystals were strongly heated on platinum foil, they melted, and were decomposed, a small amount of sublimate only being produced.

The origin of the crystalline deposit No. 3 is very obscure. Mr. Whipple informs me that he only obtained it on one occasion, many years ago, when the essential oil of almonds was prepared by distillation over the naked fire; but ever since the operation has been effected by means of a steam apparatus, he has never met with it again, and has merely obtained deposits of benzoic acid. I strongly suspect that the yellow insoluble crystals, marked No. 3, were produced by the action of ammonia on oil of bitter almonds, and that the ammonia on that occasion was probably evolved by the charring of a portion of the nitrogenous pulp of the almonds by the over-heating of the bottom of the retort. The crystalline deposits which form in oil of bitter almonds must be regarded, therefore (unless in the single somewhat inexplicable instance just stated), as simply benzoic acid resulting from the oxidation of the oil.—*Lond. Pharm. Journal, March, 1854, from Philosophical Magazine.*

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ANALYSIS OF CHURCH-HILL ALUM WATER, CITY OF RICHMOND,  
VIRGINIA, AS MADE BY

PROF. JAMES C. BOOTH, OF PHILADELPHIA.\*

The water forwarded for analysis, was received in Philadelphia in excellent condition. It is a brilliantly clear liquid, when freshly drawn, possessing an astringent, styptic taste, rendered more agreeable by its large content of sulphuric acid, and with a marked after-taste of iron. The following are the results of an exact and minute analysis of a wine-gallon (58.372 grains) of the water, calculated also into 10,000 parts, for convenient comparison with the European waters of a similar character.

Specific gravity at 60° = 1.00694.

\*[This paper should have been printed with the original matter.—EDITOR.]

*Analysis.*

	Grains in the gallon.	In 10,000 parts.
Potassa, . . .	1.323 . . .	0.2267
Soda, . . .	3.301 . . .	0.5655
Ammonia, . . .	0.192 . . .	0.0328
Lime, . . .	36.580 . . .	6.2668
Magnesia, . . .	28.688 . . .	4.9147
Alumina, . . .	21.870 . . .	3.7466
Protoxide of iron, . . .	11.838 . . .	2.0280
Peroxide of iron, . . .	62.186 . . .	10.6533
Sulphuric acid, . . .	248.950 . . .	42.6488
Chlorine, . . .	2.808 . . .	0.4810
Silica, . . .	10.429 . . .	1.7867
Phosphoric acid, . . .	trace . . .	trace.
Total, . . .	<u>428.165</u> . . .	<u>73.3509</u>
Found by direct weight, . . .	432.108 . . .	74.0267

The difference between the sum of the separate ingredients and the total amount of solid residue in the water is less than one per cent. The above ingredients are grouped together as salts, according to their respective affinities, in the following table, representing the rational analysis. The sulphuric acid belonging to the respective bases is placed opposite to them.

*Rational Analysis.*

	Grains in the gallon.	
	Salts.	Sulphuric Acid.
Sulphate of potassa, . . .	2.444 . . .	1.121
Sulphate of soda . . .	1.943 . . .	1.094
Chloride of sodium, . . .	4.627 . . .	
Sulphate of ammonia, . . .	0.643 . . .	0.451
Sulphate of lime, . . .	88.836 . . .	52.257
Sulphate of magnesia, . . .	86.064 . . .	57.376
Sulphate of alumina, (neutral,) . . .	72.928 . . .	51.058
Protosulphate of iron, . . .	24.991 . . .	13.153
Persulphate of iron, (neutral,) . . .	51.270 . . .	30.762
Persulphate of iron, ( $\frac{1}{3}$ basic,) . . .	83.355 . . .	41.678
Silica, . . .	10.429 . . .	
Phosphoric acid, . . .	trace . . .	
	<u>427.530</u>	<u>248.950</u>

		<i>In 10,000 parts of the water.</i>	
		<i>Salts,</i>	<i>Sulphuric Acid.</i>
Sulphate of potassa, . . .	0.419	.	0.192
Sulphate of soda, . . .	0.333	.	0.188
Chloride of sodium, . . .	0.793		
Sulphate of ammonia, . . .	0.110	.	0.077
Sulphate of lime, . . .	15.219	.	8.952
Sulphate of magnesia, . . .	14.744	.	9.827
Sulphate of alumina, (neutral,) . . .	12.494	.	8.747
Protosulphate of iron, . . .	4.281	.	2.253
Persulphate of iron, (neutral, . . .	8.783	.	5.270
Persulphate of iron, ( $\frac{1}{3}$ basic,) . . .	14.280	.	7.140
Silica, . . . . .	1.787		
Phosphoric acid, . . . . .	trace		
	<hr/> 73.243		<hr/> 42.648

The neutral sulphates of alumina and peroxide of iron have the formulæ  $\text{Fe}_2 \text{O}_3, 3\text{SO}_3$  and  $\text{Al}_2\text{O}_3, 3\text{SO}_3$ ; and the basic salt has the formula  $\text{Fe}_2 \text{O}_3, 2\text{SO}_3$ . The above salts may be thrown, for convenience, into the three following groups :

		<i>Grains.</i>	
		<i>Per gallon.</i>	<i>Per gill.</i>
Total amount of alkaline salts, . . .	184 $\frac{1}{2}$	.	6
“ salts of iron, . . .	159 $\frac{1}{2}$	.	5
“ persulphate of alumina, . . .	73	.	2 $\frac{1}{2}$

Of the alkaline salts nearly one-half is Epsom salts, and nearly one half of the iron-salts consists of the oxides of iron.

We have carefully compared the analysis of this water with the analysis of a large number of the alum-waters of Europe, and find only four of them which will compare with it in richness of solid content, and none of them contain the ingredients of the several classes as well proportioned. We therefore regard it as one of the richest and best proportioned of all the alum-waters known. It is at the same time an alterative, astringent, tonic and laxative. The large proportion of iron salts renders it an excellent tonic. The aluminous salt tends to give it astringency, but this effect is modified by the laxative agency of the alkaline salts, especially of Epsom salt. The combination, as a whole, makes it an alterative. It will unquestionably be regarded as a useful adjuvant to the physician, and a valuable addition to the materia medica.

## Varieties.

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[NOTE.—For nearly a year past a series of articles have been published in the *Annals of Pharmacy* under the caption “Perfumery,” by Mr. Septimus Piesse, extending over more than forty pages of that Journal. As some parts of them possess considerable interest, and many of the formulæ may be useful to our readers, it is proposed to publish those of them which are most likely to be acceptable, beginning in the present number with the second article of the series, the introductory chapter on generalities being omitted.—EDITOR AM. JOUR. PHARM.]

*On Perfumery.* By SEPTIMUS PIESSE.—The extensive flower farms in the neighborhood of Nice, Grasse, Montpellier, and Cannes, in France, at Adrianople (Turkey in Europe,) at Broussa and Uslak (Turkey in Asia,) and at Mitcham, in England, in a measure, indicates the commercial importance of that branch of chemistry called perfumery.

British India and Europe consume annually, at the very lowest estimate, 150,000 gallons! of perfumed spirits, under various titles, such as eau de Cologne, essence of lavender, esprit de rose, &c. The art of perfumery does not, however, confine itself to the production of scents for the handkerchief and bath, but extends to imparting odor to inodorous bodies, such as soap, oil, starch, and grease, which are consumed at the toilette of fashion. Some idea of the importance of this art to commerce may be formed when we state that one of the large perfumers of Grasse and Paris employ annually 80,000lbs. of orange flowers, 60,000lbs. of cassie flowers, 54,000lbs. of rose leaves, 32,000lbs. of jasmine blossoms, 32,000lbs. of violets, 20,000lbs. of tubereuse, 16,000lbs. of lilac, besides rosemary, mint, lemon, citron, thyme, and other odorous plants in like proportion. The quantity of odoriferous substances used in this way is far beyond the conception of those even used to abstract statistics, giving rise to an amount of industry truly gratifying.

The consumption of perfumery increases with the civilized state of society—it is strictly one of the arts of peace; it supplies one of our senses with a gratification; which, by use, becomes tutored to distinguish everything that is sweet to smell, and this art is certainly calculated to stamp the refinement of taste to one of our desires—the desire of pleasing the olfactory nerve.

To the chemical philosopher, the study of perfumery opens a book as yet unread; the practical perfumer, on his laboratory shelves, exhibits many rare essential oils, such as essential oil of the flower of the acacia farnesiana, essential oil of violets, tubereuse, jasmine, and others; the compositions of which have yet to be determined.

The exquisite pleasure derived from smelling at fragrant flowers, would

almost instinctively induce man to attempt to separate the odoriferous principle from them, so as to have the perfume when the season denies the flowers; and thus we find the alchemists of old torturing the plants in every way their invention could devise for this end. Their experiments were not wholly unsuccessful; indeed, upon their foundation the whole art of perfumery has been reared, which observation applies to numerous other useful manufactures. Without recapitulating those facts which may be found diffused through nearly all the old authors on medical botany, chemistry, pharmacy, and works of this character, from the time of Paracelsus to Celsart, we may state at once the mode of operation adopted by the practical perfumer of the present day for preparing the various extracts or essences, waters, oils, pomades, &c., used in his calling.

The processes are divided into four distinct operations; viz.—

1. *Expression*; 2. *Distillations*; 3. *Maceration*; 4. *Absorption*.

[The two first processes for volatile oils are so well described in the dispensatories, that they have been omitted here.]

3. *Maceration*.—Of all the processes for procuring the perfumes of flowers, this is the most important to the perfumer, and is the least understood in England; as this operation yields not only the most exquisite essences indirectly, but also nearly all those fine pomades known here as “French Pomatums,” so much admired for the strength of fragrance, together with “French oils” equally perfumed. The operation is conducted thus:—For what is called pomade, a certain quantity of purified mutton or deer suet is put into a clean metal or porcelain pan, this being melted by a steam heat; the kind of flowers required for the odor wanted are carefully picked and put into the liquid fat, and allowed to remain from twelve to forty-eight hours; the fat has a particular affinity or attraction for the oil of flowers, and thus, as it were, draws it out of them, and becomes itself, by their aid, highly perfumed; the fat is strained from the spent flowers, and fresh are added four or five times over, till the pomade is of the required strength; these various strengths of pomatums are noted by the French makers as Nos. 6, 12, 18, and 24, the higher numerals indicating the amount of fragrance in them. For perfumed oils the same operation is followed, but in lieu of suet, fine olive oil or oil of ben is used, and the same results are obtained. These oils are called “Huile Antiques” of such and such a flower.

When neither of the foregoing processes give satisfactory results, the method of procedure adopted is by,

4. *Absorption*, or *En Fleurage*.—The odors of some flowers are so delicate and volatile, that the heat required in the previously named processes would greatly modify, if not entirely spoil them; this process is, therefore, conducted cold, thus:—Square frames, about three inches deep, with a glass bottom, say two feet wide and three feet long, are procured; over the glass, a layer of fat is spread, about half an inch thick, with a kind of plaster knife or spatula; into this the flower buds are struck, cup downwards, and ranged completely over it, and there left from twelve to seventy-two hours.



Some houses, such as that of Messieurs Pilar and Sons, Pascal Brothers, H. Faye, and a few others, have three thousand such frames at work during the season ; as they are filled, they are piled one over the other, the flowers are changed so long as the plants continue to bloom, now and then over a time of two or three months.

For oils of the same plants, coarse linen cloths are imbued with the finest olive oil or oil of ben, and stretched upon a frame made of iron ; on these the flowers are laid and suffered to remain a few days. This operation is repeated several times, after which the cloths are subject to great pressure, to remove the now perfumed oil.

As we cannot give any general rule for working, without misleading the reader, we prefer explaining the process required for each when we come to speak of the individual flower or plant.

Whenever a still is named, or the article is said to be distilled or "drawn," it must be understood to be done so by steam apparatus, as this is the only mode which can be adopted for obtaining anything like a delicate odor ; the old plan of having the fire immediately under the still, conveying an empyreumatic or burnt smell to the result, has become obsolete in every well-regulated perfumatory.

The steam-still differs from the one described only in the lower part, or pan, which is made double, so as to allow steam from a boiler to circulate around the pan for the purpose of boiling the contents, instead of a direct fire. In macerating, the heat is applied in the same way, or by a contrivance like the common glue-pot, as made use of now-a-days.

This description of apparatus will be found very useful for experiments which we will suggest by-and-bye.

The perfumes for the handkerchief, as found in the shops of Paris and London, are either simple or compound ; the former are called *extraits*, *essprits*, or *essences*, and the latter *bouquets* and *nosegays*, which are mixtures of the extracts so compounded in quantity that no one flower or odor can be discovered as predominating over another ; and when made of the delicate-scented flowers carefully blended, they produce an exquisite sensation on the olfactory nerve, which conveys to us the sense of smell, and are therefore, much prized by those whose wealth enables them to indulge in such pleasures.

We shall first explain the mode for obtaining the simple extracts of flowers, which will be followed by the process for preparing *ambergris* and *musk*, substances, which, though of animal origin, are of the utmost importance as forming a large part in the most approved bouquets, concluding this department of the art with recipes for all the fashionable bouquets and *nosegays*, the value of which, we doubt not, will be estimated according to the labor bestowed upon their analysis.

Expecting these remarks to become more a work of reference than anything else, we have adopted the alphabetical arrangement in preference to a more scientific classification.

We are not going to speak of, perhaps more than a tithe of the plants that have a perfume—only those will be mentioned that are used by the operative perfumer, and such as are imitated by him in consequence of there being a demand for the article; while, at the same time, from circumstances he is unable to sell the real. The first that comes under our notice is—

**ALLSPICE.**—The odoriferous principle of allspice, commonly called pimento, is obtained by distilling the dried fruit, before it is quite ripe, of the *Eugenia pimenta* and *Myrtus pimenta* with water. It is thus procured as an essential oil; it is but little used in perfumery, and when so, only in combination with other spice oils; for scenting soap it is, however, very agreeable, and much resembles the smell of cloves, and deserves more attention than it has hitherto received. Mixed in the proportion of two ounces of oil of allspice with one gallon of rectified spirit of wine, it forms what may be termed extract of allspice, which extract will be found very useful in the manufacture of low priced bouquets.

**ALMONDS.**—This perfume has been much esteemed for many ages. It may be procured by distilling the leaves of any of the laurel tribe, and the kernels of stone fruit; for trade purposes, it is obtained from the bitter almond, and exists in the skin or pellicle that covers the seed after it is shelled.\* In the ordinary way, the almonds are put into the press for the purpose of obtaining the mild or fat oil from the nut; the cake which is left after this process is then mixed with salt and water, and allowed to remain together for about twenty-four hours, prior to distillation. The reason for moistening the cake is well understood to the practical chemist; and although we are not treating the subject of perfumery in a chemical sense, but only in a practical way, it may not be inappropriate here to observe, that the essential oil of almonds does not exist ready formed to any extent in the nut, but that it is produced by a species of fermentation, from the amygdalin and emulsine contained in the almonds, together with the water that is added. Analogous substances exist in laurel leaves, and hence the same course is to be pursued when they are distilled. Some manufacturers put the moistened cake into a bag of coarse cloth, or spread it upon a sieve, and then force the steam through it; in either case, the essential oil of the almond rises with the watery vapor, and is condensed in the still-worm. In this concentrated form, the odor of almonds is far from agreeable; but when diluted with spirit, in proportion of about one and a half ounce of the oil to a gallon of spirit or alcohol, it is very pleasant.

The essential oil of almonds enters into combination with soap, cold cream, and many other materials prepared by the perfumer; for which see their respective titles.

Fourteen pounds of the cake yields about one ounce of essential oil.

\*This is an error; the perfume is generated from principles residing in the albumen of the almond, and not in its episperm as stated.—EDITOR AMER. JOURN. PHARM.

In experiments with this substance it must be carefully remembered that it is exceedingly *poisonous*, and, therefore, great caution is necessary in its admixture with substances used as a cosmetic, otherwise dangerous results may be brought about.

**ANISE.**—The odorous principle is procured by distilling the seeds of the plant *Pimpinella anisum*; the product is the oil of aniseed of commerce. As it congeals at a temperature of about 50 Fahr., it is frequently adulterated with a little spermaceti to give certain solidity to it, whereby the addition of other cheaper essential oils can be put to it with less chance of detection. As the oil of aniseed is quite soluble in spirit, and the spermaceti insoluble, the fraud is easily detected.

This perfume is exceedingly strong, and is, therefore, well adapted for mixing with soap and for scenting pomatums, but does not do nicely in compounds for handkerchief use.

**BALSAM.**—Under this article there are two or three substances used in perfumery, such as balsam of Peru, balsam of tolu, and balsam of storax (also called liquid amber.) The first named is procured from the *Myroxylon peruiferum*; it exudes from the tree when wounded, and is also obtained by boiling down the bark and branches in water. The latter is the most common method for procuring it. It has a strong odor like benzoin. Formerly it was much used for mixing with soap, but I think more with an idea of medicinal properties than for the sake of fragrance.

Balsam of tolu flows from the *Toluiifera balsamum*. It resembles common resin (rosin); with the least warmth, however, it runs to a liquid, like brown treacle. The smell of it is particularly agreeable, and being soluble in alcohol makes a good basis for a bouquet, giving in this respect a permanence of odor to a perfume which the simple solution of an oil would not possess. For this purpose all these balsams are very useful, though not so much used as they might be.

Balsam of storax, commonly called gum styrax, is obtained in the same manner, and possessing similar properties, with a slight variation of odor, is applicable in the same manner as the above.

They are all imported from South America, Chili, and Mexico, where the trees that produce them are indigenous.

**BALM**, oil of Balm, called also, oil of Melissa, is obtained by distilling the leaves of the *Melissa officinalis* with water; it comes from the condensed steam or water, from which it is separated with the tap funnel. But very little used in perfumery, if we except its combination in *Aqua di Argento*.

**BAY**, oil of sweet Bay, also termed essential oil of laurel-berries, is a very fragrant substance, procured by distillation from the berries of the bay-laurel. Though very pleasant, it is not much used.

**BERGAMOT.**—This most useful perfume is procured from the *Citrus Bergamia*, by expression from the peel of the fruit. It has a soft sweet odor, too well known to need description here. When new and good it has a greenish yellow tint, but loses its greenness by age, especially if kept in

imperfectly corked bottles. It then becomes cloudy from the deposit of resinous matter, produced by the contact of the air, and acquires a turpentine smell.

It is best preserved in well stoppered bottles, kept in a cool cellar, and in the dark; light, especially the direct sunshine, quickly deteriorates its odor. This observation may be applied, indeed, to all perfumes, except rose, which is not so spoiled.

When bergamot is mixed with other essential oils it greatly adds to their richness, and gives a sweetness to spice oils, attainable by no other means, and such compounds are much used in the most highly-scented soaps. Mixed with rectified spirit in the proportions of about three ounces of bergamot to a gallon, it forms what is called "extract of bergamot," and in this state is used for the handkerchief. Though well covered with extract of orris and other matters, it is the leading ingredient in Bayley and Blew's Ess. Bouquet (see *Bouquets*).

**BENZOIN**, also called Benjamin.—This is a very useful substance to perfumers. It exudes from the *Styrax benzoin*, by wounding the tree, and drying, becomes a hard gum-resin. It is principally imported from Borneo, Java, Sumatra, and Siam. The best kind comes from the latter place, and used to be called *Amygdaloides*, because of its being interspersed with several white spots, which resemble broken almonds. When heated, these white specks rise as a smoke, and is easily condensed upon paper. The material thus separated from the benzoin is called flowers of benzoin in commerce, and by chemists is termed benzoic acid. It has all, or nearly all, the odor of the resin from which it is derived.

The extract, or tincture of benzoin, forms a good basis for a bouquet. Like balsam of tolu, it gives permanence and body to a perfume made with an essential oil in spirit.

The principal consumption of benzoin is in the manufacture of pastilles (see *Pastilles*), and for the preparation of fictitious vanilla pomade (see *Pomatus*).

**CASCARILLA**.—The bark is used in the formation of pastilles, also enters into the composition known as *Eau à Bruler*, for perfuming apartments, to which we refer.

**CASSIE**.—This is one of those fine odors which enters into the composition of the best handkerchief bouquets. When smelled at alone, it has an intense violet odor, and is rather sickly sweet.

It is procured by maceration from the *Acacia Farnesiana*. The purified fat is melted, into which the flowers are thrown and left to digest for several hours; the spent flowers are removed, and fresh are added, eight or ten times, until sufficient richness of perfume is obtained. As many flowers are used as the grease will cover, when they are put into it, in a liquid state.

After being strained, and the pomade has been kept at a heat sufficient only to retain its liquidity, all impurities will subside, by standing for a

few days. Finally cooled, it is the cassie pomade of commerce. The *Huile de Cassie*, or fat oil of cassie, is prepared in a similar manner, substituting the oil of Egyptian ben nut, olive oil, or almond oil, in place of suet. Both these preparations are obviously only a solution of the true essential oil of cassie flowers in the neutral fatty body. Europe may shortly be expecting to import a similar scented pomade from South Australia, derived from the wattle, a plant that belongs to the same genus as the *A. farnesiana*, and which grows most luxuriantly in Australia. Mutton fat being cheap, and the wattle plentiful, a profitable trade may be anticipated in curing the flowers, &c.

To prepare the extract of cassie, take six pounds of No. 24 (best quality) cassie pomade, and place upon it one gallon of the best rectified spirit, as sent out by Bowerbank, of Bishopsgate. After it has digested for three weeks or a month, at a summer heat, it is fit to draw from the pomatum, and, if good, has a beautiful green color, and rich flowery smell of the cassie blossom. All extracts made by this process—*maceration*, or as it may be called, cold *infusion*, give a more natural smell of the flowers to the result, than by merely dissolving the essential oil (procured by distillation) in the spirit; moreover, where the odor of the flower exists in only very minute quantities, as in the present instance, and with violet, jasmine, &c., it is the only practical mode of proceeding.

In this, and all other similar cases, the pomatum must be cut up into very small pieces, after the domestic manner of "chopping suet," prior to its being infused in the alcohol. The action of the mixture is simply a change of place in the odoriferous matter, which leaves the fat body by the superior attraction, or affinity, as the chemists say, of the spirits of wine, in which it freely dissolves.

The major part of the extract can be poured or drawn off the pomatum without trouble, but it still retains a portion in the interstices, which requires time to drain away, and this must be assisted by placing the pomatum in a large funnel, supported by a bottle, in order to collect the remainder. Finally, all the pomatum, which is now called *washed pomatum*, is to be put into a tin, which tin must be set into hot water, for the purpose of melting its contents; when the pomatum thus becomes liquefied, any extract that is still in it rises to the surface, and can be skimmed off.

The washed pomatum is preserved for use in the manufacture of dressing for the hair, for which purpose it is exceedingly well adapted, on account of the purity of the grease from which it was originally prepared, but more particularly on account of a certain portion of odor which it still retains, and were it not used up in this way, it would be advisable to put for a second infusion in spirit, and thus a weaker extract could be made serviceable for lower priced articles.

Not wishing to make unnecessary observations upon this, or any other substance treated of, for the mere purpose of writing, and thus to "make a

book," yet I cannot leave cassie without recommending it more especially to the notice of perfumers and druggists, as an article so well adapted for the purpose of the manufacture of essences for the handkerchief and pomades for the hair. When diluted with other odors, it imparts to the whole such a true flowery fragrance, that it is the admiration of all who smell it, and has not a little contributed to the great sale which certain proprietary articles have attained.

To those who are inexperienced, we caution them not to confound cassie with cassia, which has a totally different odor.

(To be continued.)

*A Permanent Double Salt of the Protoxide of Iron.*—The author states that the white carbonate of protoxide of iron, precipitated from a solution of protochloride of iron by carbonate of soda, dissolves, on the addition of diluted muriatic acid, to a colorless fluid, which remains unchanged exposed in open vessels to the air, does not become colored or turbid, and also leaves, on evaporation, an almost colorless double salt, which, exposed to the air, becomes moist, but undergoes no other change. As the dry double salt, on account of its hygroscopic properties, is less suitable for medical use than its solution, the author recommends the following form for the preparation of the solution for use;—

*Liquor Ferri et Sodæ Nitrico-chloridi:*

In one ounce of muriatic acid, of specific gravity, 1.110 iron wire is added in excess and dissolved, so that a portion remains undissolved. To the pale green clear solution a saturated solution of carbonate of soda is added for the entire precipitation of the iron; afterwards, so much diluted nitric acid is added as will exactly dissolve the precipitate; and, lastly, the solution is diluted with distilled water, until the entire solution weighs 6 ounces. An ounce then contains 12.5 grammes of iron, which are proportionate to 40 grammes of protonitrate of iron, and 26 grammes of chloride of sodium.

This preparation is a colorless fluid, without odor; possesses a saline styptic taste; may be preserved for a long time without change; and leaves behind, on evaporation, nearly a white salt.—*Annals of Pharmacy*, March, 1854. [The word *grammes*, where it occurs in this paper, should read *grains*. As the Editors of the *Annals* give no authority, they are responsible for the error.—EDITOR AMER. JOUR. PHARM.]

*The Application of Sulphate of Copper for the preservation of the Skins of Animals.* By DR. W. WICKE.—The doubtful efficacy of arsenious acid for the above object is known. Without mentioning that it poisons the air of chambers by slow decomposition, the true skin is destroyed by a peculiar arsenic emulsion, or the arsenic is only strongly taken up by the adhering flesh and fat, while the epidermis and the feathers are exposed to the unretarded destruction of the insect, which is chiefly to be feared.

Some time since, sulphate of iron was recommended instead of arsenious

acid, and employed in the same manner as that to be described for sulphate of copper. But soon the destructive influence of this agent was recognised, inasmuch as bright and particularly white feathers received a strong reddish inerustation from the separation of peroxide of iron. This is not the case with sulphate of copper. It will, in some instances, form crystals on the stems of the feathers, but these can be easily crushed and removed by means of pincers.

The sulphate of copper is employed in the form of a thick paste, made by rubbing the finely pulverized salt with water. The inner surface of the skin is spread over with the paste, and the remaining operations concluded as quickly as possible to prevent the water evaporating. If the paste is allowed to dry, the skin becomes inconveniently hard and brittle. The skin is thus thoroughly impregnated with the salt, which even penetrates into the stems of the feathers. It will now withstand decomposition, and the copper salt has a deadly action on insects. The keeper of the Oldenburg Museum has employed for several years this agent with the best results. He has found that it is advantageous to mix the sulphate of copper with about double its quantity of alum, which, by its property of forming insoluble compounds with organic tissues, may be very useful.—*Ibid*, from *Liebig's Annalen*.

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*Tincture of the Flowers of Colchicum.*—Dr. Debout has recently called attention in the *Bulletin de Therapeutique* to the advantages of the flowers of colchicum over all other portions of the plant. He declares that the tincture of the flowers is less variable than that of the seeds or root, and far more efficacious. M. Luskind, a distinguished druggist of Geneva, gives the following directions for this preparation: The flowers are to be plucked before they have faded, on a fine sunshiny day. They should be placed in a silk bag and pressed. The juice is of a dark-brown color. It must be mingled *immediately* with an equal quantity of strong alcohol, and then set aside for a month. It is then filtered.

This preparation promises to be very uniform in its effects. M. Debout has administered it with success in many cases of obstinate rheumatic neuralgia and in paroxysms of gout.

This is not the first time that the efficacy of the flowers of colchicum has been promulgated. In 1823 Dr. Copland prescribed the flowers in substance, and found them less irritating, and more efficacious than the seeds. Frost and Bushell also employed them. According to the latter, they will cure chronic rheumatism. Bushell adds that they retard the movements of the heart.—*Virginia Med. and Surg. Journ.*

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*New Method of Testing Quinine.* By Signor PAGLIARI.—Sig. Pagliari, a chemist of Rome, the inventor of a new hæmostatic compound, has published in the *Corrispondenza Scientifica* of Rome a procedure for deter-



mining the purity of the compounds of quinia with the greatest exactness; and, after repeated experiments, he has rendered the execution of his method extremely simple.

This method consists in heating a small quantity of the preparation of quinine in a spoon over burning charcoal. In a very short time the powder melts, leaving a residue of which we shall speak presently. The examination of this residue must be conducted with the greatest care, for its peculiar tint serves to characterize each compound.

Characteristics presented by perfectly pure sulphate of quinine: *residue of clear ruby color*; very pure quinine, *residue of the color of oil of sweet almonds*; citrate of quinine, *residue of clear citron color*, with excess of acid, *dark citron color*; valerianate of quinine, *residue of the color of the preparation itself*.

When either of these preparations is adulterated with foreign matter, the residue, after fusion, will be wanting in polish and transparency, and will present a blackish, porous appearance. If they are mixed with cinchonine or salicine, they become opaque; to be certain of the presence of salicine, concentrated sulphuric acid may be added, which will give rise to a red color.

These trials should be made with about a half a grain of the salts in question. The author hopes that these simple experiments will add one more obstacle to the falsifications of the salts of quinine.—*Ibid*.

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*Aconite as a Local Anodyne.*—The comparative value of several of our local anæsthetics, was well exhibited in a case recently under the care of Mr. Curling, in the London Hospital. The patient, a woman of 47, had a patch of dry gangrene on the outer side of the left foot. Its slow increase was attended with such intense pain, that for several weeks she scarcely slept at all. To obtain relief, chloroform, on lint beneath oil-silk, belladonna lotion, and the solution of opium, were severally applied to the part, with, however, but very slight and temporary benefit. A liniment, consisting of equal parts of the soap liniment and of tincture of aconite, was then ordered to be used in the same manner; and so great was its efficiency, that under its influence the poor woman was frequently able to obtain a very fair night's rest. This case is only one among many in which we have seen proved the powers of aconite as a local remedy.—*Med. Times and Gaz.*, Nov. 11, 1853.

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*Composition of Oil of Thyme.* By M. LALLEMAND.—This oil has been found by the author to contain a large quantity of stearoptene. He has given it the name of *Thymol*. It is crystalline, melts at 108° F., and will remain liquid for a considerable time at the ordinary temperature, a circumstance which may have been the reason why its presence in the oil has been hitherto overlooked. It has no rotary action on polarized light; in the crystalline state it behaves like other birefractive media. Its composition

is expressed by the formula  $C_{20}H_{14}O_2$ , differing from the camphor of *Lauræ* by two atoms of hydrogen.

Thymene, the other constituent of oil of thyme, is isomeric with terpenine (terbiné). It does not exert any rotary motion on a ray of polarized light. Its composition is represented by the formula  $C_{20}H_{16}$ .—*Pharm. Jour.*, from *Comptes Rendus*, Sept., 1853.

A writer in the *Peninsular Medical Journal*, on secret remedies, publishes the following:

I do not know that you will consider the suggestion as worth your notice; but if you do, here is a formula to begin with, which I am informed is that of Ayer's Cherry Pectoral:

R.—Acetate of Morphia,	. . . . .	grains iv.
Tinct. Sanguinaria,	. . . . .	drachms ij.
Wine of Antimony,	. . . . .	“ iiij.
Wine of Ipecac,	. . . . .	“ iiij.
Syrup of Wild Cherry Bark,	. . . . .	ounces. iiij.
		<i>N. Y. Med. Gaz.</i>

*Prize for the Cure of Cholera.*—The Academy of Sciences of Paris, has received a legacy, 100,000 francs (\$20,000), left by a generous philanthropist, M. BREANT, as a recompense for him who shall discover a remedy for cholera. As this is not likely to be soon awarded, it is proposed to give the interest annually for the most useful discovery connected with cholera. During the first empire, a similar sum was left for the curer of croup, which has not yet been awarded. The new legacy will only serve to swell that large sum which the Academy annually distributes in the form of prizes.

*Massachusetts College of Pharmacy.*—The Massachusetts's College of Pharmacy held its annual meeting in this city on the 5th inst., at the College in Phillips Place. Daniel Henchman presided. The attendance was large and the proceedings were of interest.

The following officers were elected for the ensuing year:—

Daniel Henchman, President. Samuel M. Colcord, First Vice President. Joseph T. Brown, Second Vice President. Joseph Burnett, Corresponding Secretary. Henry W. Lincoln, Recording Secretary. Ashel Boyden, Treasurer. Thomas Farrington, Auditor. Thomas Hollis, Samuel N. Brewer, Charles H. Atwood, Andrew Geyer, Atherton T. Brown, Thomas Resticaux, Samuel H. Woods, Henry D. Fowle, Trustees.

Many subjects of importance were discussed by the members. In consequence of an unusually large amount of business it was found necessary, at a late hour, to meet again three weeks from date.—*Boston Med. and Surg. Journal*.

## Minutes of the College.

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At a stated meeting of the Philadelphia College of Pharmacy, held Third Month March 27th, 1854. In the absence of the presiding officer Professor Bridges was called to the chair. The minutes of the last stated meeting were read and approved. The minutes of the Board of Trustees were then read by their Secretary. Since the last meeting of the College, they have elected William Taylor, Graduate in Pharmacy, a resident member. They also recommended to the College, E. H. Heinitsh, of Columbia, S. C., as an associate member.

The minutes of the Board further informed that the Examining Committee and Professors had reported the names of 26 gentlemen, as having passed a satisfactory examination, and complied with the requirements of the College, and worthy the Degree of Graduate in Pharmacy. (See page 285.)

In accordance with the recommendation of the Committee and Professors, the Board proceeded to an election, and the Degree of Graduate in Pharmacy was unanimously conferred on each of them.

A written report was received from the Committee on Latin Labels, which was satisfactory, and the Committee was continued.

The Committee on a modification of the By-Laws regulating the admission of members was further continued.

On motion, the College proceeded to the election of E. H. Heinitsh, as an Associate Member, as recommended by the Board of Trustees. E. T. Ellis was appointed Teller, upon whose report the Chairman declared him unanimously elected.

On motion of Edward Parrish, it was resolved that the Board of Trustees have authority to dispense with the present seal, now in use on the diplomas, and have a new one made for use on the diplomas and certificates of membership, in accordance with the suggestion of a Committee of the Board, as detailed in their minutes.

The Committee appointed to inquire into the reputed abuse of the name of the College, in connection with business advertisements, made a report absolving the member complained of, from any intentional impropriety of conduct. The report was satisfactory, and the Committee were discharged from further attention to the subject.

Considerable discussion ensued as to the propriety of using the certificate of membership, or the diploma of the College, as a passport to public favor through the medium of the press, and the following resolution being offered, was adopted.

Resolved, That it is the sense of this College, that the publication of the certificate of membership and the diploma, as a business advertisement, is anti-professional and inconsistent with the spirit of our code of ethics.

A communication from Thos. H. Montgomery, a member and graduate of this College, informing that he had withdrawn from the business on account of ill health, and desired to withdraw from membership, was read and accepted, and by a vote of the College he was allowed to retain his certificate of membership, at his own request,

The following report of the Publishing Committee, accompanied by a statement of its Treasurer, was read and accepted.

*To the Philadelphia College of Pharmacy.*

The Publishing Committee respectfully report, that since their last communication to the College, the *Journal* has issued regularly every other month at or before the appointed time. The change then announced as having been adopted, in regard to the increased size of the Volume, has now been tried for more than a year, and the subscribers having had an opportunity to consider the new arrangement have generally given it their approval.

The printing and paper required by the extra copies and the larger size of the *Journal* have caused a much larger demand on the Treasurer, and the Committee believe it inexpedient to withdraw any funds from his balance, for the sinking fund, except the \$50 usually appropriated.

The Report of the Treasurer, annexed here unto, will exhibit the state of the finances of the *Journal*, all of which is submitted by

CHARLES ELLIS,	} Committee.
W. PROCTER, JR.,	
R. BRIDGES,	
A. B. TAYLOR,	

The report of the Committee on the Sinking Fund was read and approved.

On motion, the Board proceeded to the annual election of officers for the ensuing year.

Wm. J. Jenks and Daniel S. Jones were appointed Tellers, and the College took a recess for a few minutes. The meeting being called to order, the Tellers reported that the following members had received a majority of votes for the respective offices, and they were accordingly declared duly elected.

<i>President</i>	. . . :	. . . .	Charles Ellis,
<i>1st Vice President</i>	. . . .		Samuel F. Troth,
<i>2d Vice President</i>	. . . .		Dillwyn Parrish,
<i>Treasurer</i>	. . . .		Ambrose Smith,
<i>Recording Secretary</i>	:	. . . .	Edward Parrish,
<i>Corresponding Sec.</i>	. :	. . :	Joseph C. Turnpenney.

*Trustees.*

William Procter, Jr.,	Robert Bridges,
John H. Ecky,	Edward Parrish,
William P. Troth,	Daniel S. Jones,
Caleb H. Needles,	W. W. D. Livermore.

*Publishing Committee.*

Robert Bridges,	William Procter, Jr.,
Edward Parrish,	Charles Ellis,
Alfred B. Taylor.	

*Committee on Sinking Fund.*

Samuel F. Troth,      Ambrose Smith,      Edward Parrish.

*Delegates to the American Pharmaceutical Association.*

Henry C. Blair,      John H. Eeky,      Charles Ellis.

Charles Bullock,      Charles H. Dingee,

And the Board adjourned.

DILLWYN PARRISH,

*Secretary.*

## Philadelphia College of Pharmacy.

### COMMENCEMENT—1854.

The Annual Commencement of the Philadelphia College of Pharmacy was held on Tuesday evening, April 18th, at 8 o'clock, in the Musical Fund Hall, in the presence of a large and respectable audience.

The Degree of Graduate of Pharmacy was conferred, on behalf of the Board of Trustees, by its Presiding Officer, HENRY C. BLAIR, Esq., on the following gentlemen:

Graduating Class.		Subject of Thesis.
MAURICE W. ALEXANDER,	Pa. . . .	Melissa.
THOMAS H. BARR,	Ind. . . .	Magnesia.
MORTIMER H. BICKLEY,	Pa. . . .	Eupatorium Perfoliatum.
JAMES L. BISPHAM,	" . . . .	Potassæ Phosphas.
HENRY C. BOWER,	" . . . .	Ricinus Communis.
JOHN BROUGHTON,	Va. . . .	Preparation of the Salts of Nickel.
THOMAS M. CLARK,	N.J. . . .	Opium.
RICHARD S. COX,	N.Y. . . .	Juglans Cinerea.
ROBERT K. DILLARD,	Ala. . . .	Spigelia Marilandica.
CHARLES H. EGGERT,	Pa. . . .	Manganese and its Preparations.
LOUIS M. EMMANUEL,	" . . . .	Cassia.
EDWARD GAILLARD,	" . . . .	Arnica Montana.
SAMUEL GERHART,	" . . . .	Adulteration of Drugs.
EDWARD H. HANCE,	" . . . .	Chimaphila Umbellata.
LEVI H. HARRIS,	" . . . .	Chimaphila Umbellata.
DAVID S. JACOBY,	" . . . .	Achillea Millefolium.
JOSEPH LEMBERGER,	" . . . .	Gillenia Trifoliata.
DAVID LEWIS, JR.,	" . . . .	Gillenia Trifoliata
GEORGE H. MARKLEY,	" . . . .	Quassia. <small>(as compared with Ipecacuanha)</small>
WILLIAM J. MILLER,	" . . . .	Pareira Brava.
JOHN H. PALETHORP, JR.,	" . . . .	Rudbeckia Laciniata.
JAMES T. SHINN,	" . . . .	Gossypium Herbaceum.
DAVID L. STACKHOUSE,	" . . . .	Iris Versicolor.
HENRY C. STEEVER,	" . . . .	Radix Helonias Dioicæ.
WILLIAM H. THOMPSON,	" . . . .	Scoparius.
JOHN WYETH,	" . . . .	Gillenia Trifoliata.

After the ceremony, the Valedictory Address was delivered by Prof. ROBERT P. THOMAS.

By Order of Board of Trustees,

ALFRED B. TAYLOR, Secretary.

## Editorial Department.

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MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.—The time of the annual meeting of this body is rapidly approaching. There is no class of persons whose avocation requires more unremitting attention, than pharmacutists; and none to whom recreation is more acceptable. Many of the brethren in the Atlantic cities, have not yet visited the valley of the Ohio, and we would suggest to these, the idea of getting into the cars some pleasant morning about the 23d of July, and be wafted over the Alleghanies and down the Ohio, so as to reach Cincinnati on or before the 25th of that month, to attend the meeting of the Association, after which they can return by Niagara and the Hudson.

The hint is hardly necessary to our western friends; they are so accustomed to locomotion, that a few hundreds of miles is a small obstacle to them, if their interest is excited. Last year, Baltimore was without a representative at Boston. There has never been a member from the South, except from Richmond. The Association is national, its members should hail from every State. Charleston and Savannah, Mobile and New Orleans, Natchez, Nashville and St. Louis, have pharmacutists, whose countenance and talents would be useful to the Association, and on whom the influences of the Association would react beneficially. Then Chicago and Detroit, Cleveland, Pittsburg and Buffalo, Rochester and Albany, have equally honorable examples. Our New England brethren, who turned out so earnestly last year, will not be absent. Philadelphia has appointed delegates, and New York will doubtless be well represented. Under these circumstances, it is reasonable to anticipate a full meeting on the banks of the "*beautiful river*," in the Queen City of the West:

In glancing at the future prospects of the Association, we do not see the elements of sudden growth to power and influence. Originating in the most disinterested spirit, it has so far been carried on, without stooping from its high aims. These have had reference chiefly to the drug market, to the existing state of pharmacy, and to local organization.

The primary importance of increasing the facilities for pharmaceutical instruction, is beginning to attract the attention it deserves. Many young men perceive that there is something else required, besides the practical routine of the shop, to make a thorough pharmacist, and they are seeking

a higher education. These and all other points tending to improve the internal condition of the profession, should be urged forward and encouraged by the Association.

But there is another vocation, for which it seems peculiarly fitted, and which would add largely to its usefulness. We allude to the adoption of measures calculated to enlist the talented members of the profession, and to direct their efforts to some of the objects of investigation of the deepest interest to medicine and pharmacy. The noble results that have been called forth by the annual questions of the French Academy, are an example of what can be accomplished by this kind of encouragement. The annual meetings of the Association would become rich treats of intellectual pleasures, affording an ample return to the members for the sacrifices they make to get to them; its character as a body would acquire firmness and respectability; its published transactions would become valuable contributions to the literature of science, and a field would be opened and a tribunal be erected, where the honorable exertions of aspiring talent and industry would meet with a just appreciation.

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BIOGRAPHY OF DR. DALTON.—Dr. John Dalton, the illustrious discoverer of the law of multiple proportions and author of the Atomic theory, died in 1844, and bequeathed his papers to Dr. William Charles Henry, as his literary executor. Dr. Henry has nearly completed a biography of Dr. Dalton, which will be published under the auspices of the Cavendish Society, than which no more appropriate publisher could have been chosen.

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CASTILLON'S ELIXIR.—A correspondent having inquired for the formula for the above preparation, which has been prescribed to some extent in this city, the following has been given to us, as the recipe for making it.

R. Pulv: Cinchonæ Rubra,  
 Pulv: Gentianæ,  
 Pulv: Columbæ, aa ʒj.  
 Pulv: Ipecacuanhæ, ʒss.  
 Pulv: Cinnamomi ʒj.  
 Capsulæ Papaveris. ʒij.  
 Spiritus Vini Gallice, Oijj.

Macerate the ingredients for twelve hours and displace, using diluted alcohol to remove the last portion of the tincture.

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NICKEL'S PATENT ELASTIC PLASTER.—Since noticing these plasters in the January number, we have received from Mr. Henry Lowe, of Fayette and Park Sts., Baltimore, (who has obtained the Agency for the United States,) several samples of the plaster of different kinds and qualities. The tissue upon which the plaster is spread being woven and elastic, it admits of application over any inequalities of surface, as at the joints. The prices quoted are \$1.50 and \$1.75 per yard eight inches wide, according to the fineness of the tissue.



NEW YORK JOURNAL OF PHARMACY.—We were not aware, until after our last number had been printed, that the New York Journal of Pharmacy had been continued under new auspices, as an independent Journal. The editorship is in charge of Dr. Thomas Anticell, whose chemical predilections will prove useful to his readers. The names of Dr. Torrey, Dr. Enderlin and Mr. Canavan are attached as collaborators. The size has also been increased to 48 pages, and altogether the work presents an improved aspect. If the pharmacutists of New York city will make it the vehicle for communicating observations and discoveries, they would be doing service to the profession, and advance the character of the Journal.

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CORRECTION.—In the formula of Mr. Wiegand, for Compound Syrup of Phosphate of Iron, in our last number, the phosphate of potassa was accidentally omitted in copying for the press. Our readers will please to turn to page 112, and add with a pen "Phosphate of Potassa, two drachms," after line 3d from the top.

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ANALYSIS OF CHURCH HILL ALUM WATER.—The analysis of this mineral water as presented at page 269, was handed to us for publication by Dr. Joseph Klapp, of Philada, who copied it from the original draft, signed by Prof. Booth in his public capacity of analytical chemist.

As the publication of the formula in this Journal has no object but as a record of scientific investigation, Prof. Booth desires, in justice to Mr. T. H. Garrett, his laboratory assistant, that the analysis should be attributed to Mr. Garrett equally with himself.

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THE GEORGIA BLISTER AND CRITIC, is the title of a Southern Medical Journal dating from Atalanta, March 1st, 1854, "devoted to the development of Southern Medical literature, and the exposition of the diseases and physical peculiarities of the Negro race." The tone of the Blister is independent, and the style racy, perhaps a little too spicy. The Editor Dr. H. A. Ramsey is an ultra Southern man, and speaks out what he thinks, perhaps a little too freely for the conventional proprieties of medical Journalism.

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EDITORIAL CHANGES.—Doctors F. G. Smith and J. B. Biddle have retired from the editorial charge of the Medical Examiner, (of Philadelphia,) which Journal is now edited by Dr. Samuel L. Hollingsworth.

Dr. Joseph Parrish, editor of the New Jersey Medical Reporter, having removed to Philadelphia, has resigned the editorship of that Journal, but continues as associate editor, Dr. Butler, late associate editor, now assuming the editorial supervision.

The Richmond Stethoscope has been bought by, and is now the organ of the Virginia Medical Society, Dr. Gooch retiring from the editorial chair, and Dr. T. P. Atkinson assuming the editorship, assisted by a Committee.

# THE AMERICAN JOURNAL OF PHARMACY.

JULY, 1854.

## AMERICAN PHARMACY.

By EDWARD PARRISH.

Continued from page 217.

In considering the best plan for organizing the profession of Pharmacy, we are met at the outset with the fact, that from the first suggestion of an extended organization, two different views have been entertained, one looking toward the formation of local societies, colleges, &c., which should be duly represented in a national congress, whose members generally should be accredited as delegates; and the other proposing the immediate union of all well-disposed pharmacutists into a national association, without regard to location or previous organization, the influence of which should be exerted for the improvement of Pharmacy throughout the whole country, and, as fast as circumstances would allow, in promoting the organization of local societies on the same general plan and with similar objects in view.

The origin of the first convention accounts in part for the prevalence of the first named view. The discrepancies occurring at the different ports of entry in the administration of the law for the inspection of imported drugs and medicines, led to a united action of the different incorporated colleges of pharmacy, to endeavor to fix standards of purity for the various leading medicines passing through the custom houses, and thus, as far as these legally authorized institutions could influence the policy of the different special examiners of drugs, to produce the uniformity of action among them that would be desirable. For this object, involving as it did many delicate questions requiring knowledge and experience to settle them aright, and in which grave differences of opinion would be sure to arise, and the sanction of majorities, pro and con, be sought, and in which a sort of official force was designed to be imparted to the decisions, there were strong reasons for requiring that the conventions should consist of carefully selected representatives from established societies.

The object and scope of the American Pharmaceutical Association was, from the first, widely different from this. In the Philadelphia College of Pharmacy, where the idea of such an organization originated, it was proposed, at the time of selecting delegates to the convention in New York for the above purpose, that the delegates should suggest holding a convention at a future day, with a more general object in view—a convention in which all well-disposed druggists should enjoy an opportunity to mingle and compare sentiments upon their common duties, responsibilities and interests, and originate plans for the improvement of their art and the advancement of their professional interests.

The convention of 1851, in New York, entertained this proposition, and issued an invitation confined to delegates from existing pharmaceutical organizations to attend, in the following year, in Philadelphia; but the convention of 1852, as soon as the question of organizing came before it, evinced a wider and more liberal spirit, adapted to the more extended field of labor which seemed opening before it, and, as a result, adopted the present section of the constitution relating to members.

And yet this section must be regarded as a sort of compromise between the more progressive and ultra conservative ideas of members. For although, *practically*, it seems to have opened the door to all rightly disposed pharmacutists to enter the organization by pursuing the rather awkward and sometimes difficult preliminary steps laid down, yet in the Code of Ethics, which is made a test of admission to membership, a clause is inserted which would, if *strictly construed*, keep out some of the most interested and efficient members. The obligation "to discountenance quackery," although one which will certainly be increasingly felt by members as they become imbued with the prevailing spirit of the association, has never impressed itself as a duty upon many whose aid we desire to invoke in our earliest efforts. It is mainly by the sale of quack medicines that many druggists subsist, who yet desire a reform in their business, and would be glad to co-operate in the laudable objects of the association. In view of these considerations the writer is led to advocate a cordial welcome into the association of all druggists, apothecaries and chemists who desire self improvement, and are willing to identify themselves with the general progressive movements

growing out of such an association. Let us abolish all tests of membership, and trust to the force of sound principle and the contagion of good example to spread through our ranks a higher and better standard of practice.

By the more complete incorporation of the popular element into the national organization, we may hope to extend its usefulness to localities which would otherwise be unrepresented at its meetings. We shall be able to extend the system of regular apprenticeships throughout the west, and, through the employers to incite in apprentices a disposition to advance their own interests and those of the profession at large by higher scientific attainments and more thorough practical training. The Pharmacopœia, as a standard of practice, we may hope will be more generally used. The petty jealousies that keep apart those whose interests are similar, may be expected to melt away, in great measure, before the "esprit de corps" which the Association will seek to foster and maintain, and the diffusion of theoretical and practical knowledge by the reading of prize essays and the discussion of scientific and business topics at the meetings will be more widely useful in proportion as the doors are thrown open to all who are disposed to join and attend upon the Association at its migratory meetings.

As the sphere of the National Association is extended, we may anticipate that the local organizations, which were sought in the first instance as a primary object, will gradually take place as a secondary result, and these growing out of the parent stem, will be more completely assimilated to it and to each other, than as though independently organized each on its own basis.

If the twenty-five towns in the United States, which have at least ten druggists and apothecaries, were each to contain a Pharmaceutical Society auxiliary to the National Association, the influence of the profession of Pharmacy would soon be felt over the entire country.

The organization of druggists, chemists and apothecaries into local societies, however small, is then an object of the highest utility, and one to be kept constantly in view. The most potent motive for organization would be found in self-interest. There is scarcely a town in which a united effort of the druggists, might not so elevate the character of the trade as to make the business

of *all* more lucrative and more respectable, without materially abridging the independence of *any*.

The evils of unrestrained competition and want of united action, seriously affect the profits of our business. 1st. In the undue reduction of prices, the greatest bane of Pharmacy. 2d. In the sale of quack medicines, in place of standard preparations of our own manufacture. 3d. In the failure to secure from physicians a due regard to the rights and immunities of apothecaries.

Suppose a half dozen druggists, who supply a town and its vicinity mainly with medicines, to enter in good faith into a compact to keep up, or, if necessary, to elevate the standard of prices, so as to be amply remunerative, adding to this, a determination to compete with each other only in the improvement of the character of the business. The advantage would soon be experienced by the public in an improved Pharmacy; physicians would find it expedient to give up the preparation of medicines to those to whom it legitimately belongs; the sphere of each qualified Pharmaceutist would be extended, the business would begin *to pay*; quack medicines would be found less profitable to deal in than the standard preparations, and the public mind would soon begin to yield to the united and steadily directed effort of the apothecaries, and the physicians, their powerful allies, in turning back the tide of quackery. New demands would soon grow up, in supplying which, new sources of profit would arise, and ultimately the desire for self improvement, if not the necessity for it, would lead to a closer and more effective union, which would find in the great national organization occasion to affiliate with other and longer established Associations.

Let us not then begin by measures calculated to arouse the prejudices, or wound the interests of any. Let us not too much despise self-interest as the strongest motive we can invoke to draw together those we seek to unite. Once present this motive in all the force of which it is capable, and organization, both local and national, will be the result. From this organization alone, we may expect to grow those extended and philanthropic views and measures which will challenge the respect of the nation at large, and give character and influence to the *Profession of Pharmacy*.

## EXAMINATION OF IODIDE OF POTASSIUM.

BY J. M. MAISCH.

Having lately had opportunity of testing the purity of various parcels of iodide of potassium, I deem it proper to state the result of these investigations, and at the same time to call attention to a very easy way of determining very nearly the purity and value of this salt; not only the present high price of it may justify the publication of this paper, but still more so its high value and extensive use by practitioners, and its liability to adulteration, against which to put the apothecaries on their guard is the object of these lines.

Several years ago Marozeau proposed to ascertain the purity of iodide of potassium by dissolving 5 grs. of it and two grs. of corrosive sublimate—that is two equivalents of the former and one of the latter—separately in about 3 oz. of distilled water, and dropping the last into the first solution until a red tinge is produced which does not disappear after stirring well with a glass rod; comparing the quantity of the solution left with its original quantity indicates the purity of the iodide. In this process the iodide, as will be seen by reference to some table of weights of the equivalents, just suffices to dissolve the formed biniodide of mercury ( $2 \text{ KI} + \text{Hg Cl} = \text{KI}, \text{HgI} + \text{KCl}$ ), and consequently no precipitation can take place, if the first article is chemically pure, the commercial corrosive sublimate in general being pure. As soon as on the addition of the last, that iodide necessary for keeping in solution the biniodide of mercury, is decomposed, a red tinge appears, owing to the separation of the mercurial iodide.

Thinking that thus easily within a fraction the per centage of impurities might be found, I have altered a little the above quantities. In the following examinations I have dissolved 10 grs. of iodide of potassium in about 2 oz. of water, and 4 grs. of the corrosive sublimate in exactly 2 oz. 2 scr. (1000 grs. troy) of water. The weight in grs. of the solution of corrosive sublimate left after the reddish tinge appears expresses very nearly the amount of impurities present in 1000 parts of the examined sample. The annexed table shows the purity of several different articles of iodide of potassium ascertained in the above way:

Iodide of Potassium.	Solution of Corr. Sub. left after the exami- nation—grains.	Percentage of	
		Pure Iod. of Potass.	Impurities.
1. From Atkinson & Biggar, London	0	100	0
2. Sold as an English article	45	95.5	4.5
3. do. Large crystals	52	94.2	5.2
4. Same bottle, smallest crystals	248	75.2	24.8
5. French from Conrad, Paris	141	85.6	14.4
6. The same	155	84.5	15.5

In order to find the amount of chloride of potassium, the presence of which was shown by tests, of the specimens No. 3 and 4, 100 grs. were precipitated by nitrate of silver, the precipitate treated with ammonia and the filtered liquor neutralized with nitric acid, to separate the chloride of silver. Thus it was obtained of

No. 3. 134 grs. AgI, and 3 grs. Ag Cl, corresponding with 94.72 per ct. K I, 1.57 KCl.  
 4. 99 " 16 " 69.75 " 8.32

The chloride found is but a fraction of the amount of impurities, therefore some other body must be present. I have satisfied myself about the absence of carbonates, but could not proceed any further as the article was returned to the vender. It is proper to state still further that the small crystals were very damp; some of them lost at 80°, 2 per ct.; and at 212°, 2 more per centage of moisture, some of the large crystals at 212° not quite 1 per cent.

20 grs. of specimen Nos. 5 and 6 were precipitated by sulphate of copper under addition of sulphurous acid. The obtained protoiodide of copper weighed 19 grs. equal to 16.55 grs. or 82.75 per ct. of pure iodide of potassium. The fine unsuspecting appearance of this chemical induced me to prove the correctness of the above examinations by ascertaining directly the quantity of iodine. I have not searched yet for the nature of the impurities.

From the foregoing statements it appears that according to Marozeau's treatment invariably a larger per centage of pure iodide of potassium is found, being, however, not over 1 or 1.5 per cent. if the impurities are equally diffused among the pure iodide, and some practice enables the operator to find the right point where to stop adding the solution of corrosive sublimate. The greatest difference among the above is with No. 4, being about 5.6 per cent. which, however, seems to me can be explained by the crystals not being an even mixture of the iodide with the impurities, as can be judged from the analysis No. 3 of the



largest crystals in the same bottle mixed with very small ones analyzed under No. 4.

Now, although by the method of Marozeau the true purity of iodide of potassium can not be found, it is so very convenient on account of its simplicity and quickness, that it deserves to be recommended to the druggists for their general adoption, if they have not time to make a quantitative analysis of the amount of pure iodide present by converting it into the protoiodide of copper.

*Philadelphia, June, 1854.*

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#### NOTICE OF AN ATTEMPT TO POISON WITH STRYCHNIA.

By HENRY F. FISH, of Waterbury, Conn.

On the 4th of March last, a gentleman of this city brought me a small basket containing his dinner, which, he said, he had been deterred from eating, owing to the discovery of a very unpleasant bitter taste developed on biting a fried cake. The basket was wrapped loosely in a paper, and my attention was immediately called to some white grains lying near and under the bottom of the basket. On examining these, as well as the contents of the basket, with a magnifying glass, I was enabled to obtain and preserve nearly all the suspected substance, not actually absorbed by, or adhering to, the various articles of food. From the physical aspect and intense bitter taste of these small white grains, I was induced to think the suspected substance was *amorphous commercial strychnia*, combined, as that sort of strychnia generally is, with *brucia*, in just sufficient quantity to render it *chemically impure*. I employed the following means for identifying these substances.

1st. A portion of the suspected powder was boiled with water, but remained nearly, if not quite, insoluble, imparting to the water, on cooling, a slight opacity. The taste of this mixture was purely and intensely bitter, leaving upon the tongue, for many hours, a peculiar impression.

2d. A portion of the same powder was then submitted to the action of nitric acid of 44°. It was entirely dissolved, without any evolution of gas, and the mixture assumed a decided *brick red color*.

3d. A portion of the same substances, not more than one tenth of a grain, was moistened with strong sulphuric acid; to this a minute quantity of red ferro-cyanide of potassium was added, when a copious violet color, of remarkable beauty, was produced.

Again, some of the same powder was moistened with strong sulphuric acid, and a single drop of a strong solution of yellow chromate of potassa added. The usual violet color was decided and abundant, but not so striking in its effects, as in the preceding experiment.

If it be asked, which, of all these results, was the most satisfactory, I reply, all of them were decided and characteristic; but I regard the last with red ferri-cyanide of potassium, (next to the peculiar taste,) as the most decided and delicate. I should think that the violet color in this experiment, could be produced by the presence of even so small a quantity as the one thousandth part of a grain of the ordinary *commercial strychnia*.

The contents of the basket were bread and butter, dried beef, cheese, fried cakes and a small fruit pie. The cakes and beef had retained a larger proportion of the strychnia than the other articles. On examining the upper crust of the pie, some minute particles of the strychnia were readily discerned, adhering to it. The whole have been carefully sealed up and laid aside for future examination, if necessary. Judging from the quantity found in the basket and on the paper, I should think that at least ten grains of strychnia had been thrown into the basket.

The position of the basket during the forenoon of this day, the limited number of workmen have access to the workroom, with some other attending circumstances, leave no doubt upon my mind, that an attempt at sure and fatal poisoning was made, and the individual suspected has since left the country.

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#### SYRUPUS CALCIS PHOSPHATIS.

By THOMAS S. WIEGAND.

In the twenty-fifth volume of the American Journal of Pharmacy, page 411, a formula for a syrup of phosphate of lime was published by Mr. A. Durand, which, being prepared by means of phosphoric acid, is so thoroughly in accordance with the chemis-

try of the salt used, that it challenges the respect of the profession ; but, while so chemically correct, it has been found in practice that the free use of phosphoric acid in many cases is not unattended with disadvantage ; the more so, as the class of persons intended to be benefitted by the syrup in question, cannot endure the slightest diarrhœa without being much injured.

Yet the use of the phosphates of iron, lime, soda and potash, has proven satisfactory in the hands of several of our first physicians, and, in view of these facts, it was thought that a formula avoiding free phosphoric acid might be of use :

R. Calcis phosphatis precip.	℥j.
Acidi chlorohydrici	f.℥iv.
Aquæ q. s. ft.	f.℥vii.
Sacchari q. s. ft.	f.℥xiiss.

Dissolve the phosphate of lime, previously mixed with an ounce of water by means of the acid, filter, then add the remaining water ; to this add the sugar, until the bulk is increased to twelve fluid ounces, and strain.

#### SYRUPUS MANGANESLÆ PHOSPHATIS.

By THOMAS S. WIEGAND.

The attention of the medical profession having been called to manganese as a remedial agent, and many writers having recommended it as suitable to those cases in which the ferruginous salts were inapplicable by reason of their tendency to produce headache, it was thought that a phosphatic salt of manganese would be preferable to any other preparation, as the phosphates generally have been found advantageous in anemic conditions of the system. To be a satisfactory preparation, it should be in solution and unalterable by exposure to the air.

The following formula, combining these pre-requisites, is of such a strength that each fluid drachm contains five grains of phosphate of manganese :

R. Sulphate of manganese (in crystals)	℥jss. gr. xvii.
Phosphate of soda	℥iiss. or q. s.
Chlorohydric acid	f.℥iv.
Water q. s. ft.	f.℥vii.
Sugar q. s. ft.	f.℥xiiss.

Dissolve the salts separately each in half a pint of water, and add the solution of phosphate of soda to the solution of sulphate of manganese as long as it produces a precipitate, which wash with cold water and dissolve by means of the chlorohydric acid; dilute till it measures seven fluid ounces, then add sugar sufficient to make up the bulk of twelve and a half fluid ounces.

*Philadelphia, June 15th, 1851.*

# ON THE PREPARATION OF THE SYRUPS OF ORANGE PEEL, TOLU AND GINGER, AND ON THE SYRUP AND FLUID EXTRACT OF VANILLA.

By WILLIAM PROCTER, JR.

When an aromatic tincture, made with alcohol of sp. grav. .835, holding in solution volatile oil, resin, extractive and other principles, is suffered to evaporate spontaneously, a considerable portion of the alcohol may be separated without occasioning much precipitation of these principles. If, now, such a partially evaporated tincture be triturated with a mixture of carbonate of magnesia and sugar, and water be gradually added, the odorous and sapid principles are dissolved to a large extent, and by filtration a transparent liquid is obtained, containing but little alcohol, and which forms with pure sugar a perfectly transparent syrup, highly charged with the aroma and taste of the substances treated.

The idea of using carbonate of magnesia as an inter-medium, in preparing the aromatic waters, has long been in use, but its application to the preparation of liquids for syrups was first suggested in print by John D. Finley, (*Amer. Jour. Pharm*, vol. 23, page 219,) yet he makes no provision for the removal of the alcohol.

By adopting the idea above sketched forth, a number of syrups can be prepared, so as to produce their aromatic qualities in perfection.

## *Syrup of Orange peel.*

Take of Peel of sweet oranges,

recently dried,	two ounces.
Carbonate of magnesia,	half an ounce,
Sugar, in powder,	two pounds and a half,
Deodorized alcohol, and	
Water,	of each a sufficient quantity.

Reduce the orange peel to coarse powder, put it in a small glass percolator, and pour deodorized alcohol slowly on it till six fluid ounces of tincture have passed. Evaporate this spontaneously, or by a heat of 120° F., till reduced to one third; triturate this with the carbonate of magnesia, an ounce of sugar, and half a pint of water gradually added, as in making the officinal aromatic waters; pour the mixture on a filter, and when the liquid ceases to pass, add water till a pint has filtered. To this add the sugar in a covered vessel, dissolve with a gentle heat and strain, if necessary, through cotton flannel. Thus made, syrup of orange peel possesses all the delightful flavor of the rind, keeps well, and is superior to that made by a process previously suggested by me in the 19th vol. of this Journal, and noticed at page 1206 of the 9th edition of the U. S. Disp., and which Mr. Laidley, without being aware of it, has re-suggested at page 106 of this volume.

*Syrup of Tolu.*

Take of Balsam of Tolu,

Carbonate of Magnesia,	each half an ounce,
Sugar,	two pounds and a half, (troy,)
Alcohol,	a fluidounce,
Water,	a sufficient quantity.

Triturate the tolu with the carbonate of magnesia and an ounce of sugar, add first the alcohol, and then water gradually during the trituration, till the mixture measures about twelve fluidounces, and pour it on a filter. When the liquid ceases to pass, add water till the filtrate amounts to a pint. Dissolve the sugar in this by means of a gentle heat, and strain through damp cotton flannel, if required.

If the tolu is very soft, it will be best to dissolve it in the alcohol in a capsule, and then triturate it with the sugar and magnesia, and finally the water. Where the tolu is sufficiently dry to pulverize, the preparation may be made without any alcohol; but in general it is best to use deodorized alcohol, the small quantity of which is of little account.

*Syrup of Ginger.*

Take of Jamaica Ginger,*	four ounces,
Carbonate of Magnesia,	an ounce,
Sugar,	twenty pounds, (Troy.)
Deodorized alcohol, and	
Water,	each a sufficient quantity.

Reduce the ginger to a uniform coarse powder, pack it in a displacer, pour on the alcohol slowly till eight fluidounces of tincture has passed, evaporate this spontaneously, or at 120° F., till reduced to three fluidounces, triturate it with the carbonate of magnesia, and two ounces of the sugar, and add gradually two pints of water. Pour this on a filter, and when the liquid ceases to pass, pour on water until eight pints are obtained. Dissolve the sugar in this in a covered vessel and strain, if necessary, through cotton flannel.

It will be perceived that the proportion of ginger to syrup is larger in this than in the officinal formula. The object of this change, is to admit of the use of less alcoholic menstruum, as well as because it is believed advantageous for many of the purposes for which it is used.

*Fluid Extract of Vanilla.*

Take of choice Vanilla,	an ounce, (Troy.)
Sugar,	fourteen ounces, (Troy.)
Deodorized alcohol,	four fluidounces,
Diluted alcohol, and	
Water,	of each a sufficient quantity.

Cut the vanilla in short transverse slices, beat it to a pulp with two ounces of the sugar and a little alcohol, put the mixture in a small percolator, and pour gradually on first the alcohol, and afterwards diluted alcohol, till twelve fluidounces of tincture are obtained. Add two ounces of sugar to this tincture, evaporate it at 120° F. till reduced to six fluidounces; then add the remainder of the sugar and five ounces of water, or as much as is sufficient to make the whole measure a pint. Thus made, fluid extract of vanilla embodies all the aroma of the beans, and is well adapted for pharmaceutical and culinary uses.

\*When desired, a pint of officinal tincture of Ginger may be used, to avoid the special preparation of the tincture, evaporating it to four fluidounces at 120° F.

*Syrup of Vanilla.*

Take of fluid extract of Vanilla,	two fluidounces,
Simple syrup,	two pints,

Mix them.

Or, if a perfectly transparent syrup is desired,

Take of fluid extract of Vanilla,	two ounces,
Carbonate of Magnesia,	two drachms,
Water,	one pint,
Sugar,	two and a half pounds, (Troy.

Triturate the fluid extract and carbonate together, add half a pint of water gradually, filter, mix this liquid with the remainder of the water, add the sugar, dissolve by aid of heat and strain.

## PHARMACEUTICAL GLEANINGS.

*Oil of Morphia. Insolubility of Morphia in Chloroform.*—A few months ago, (Jan. 1854,) we published a short note in reference to “oil of morphia,” as described by M. St. Lager, in which chloroform was the *medium* of solution. M. Lepage, (*Jour. de Pharm., Avril, 1854,*) refers to a previous article by himself, on the solvent powers of chloroform, in which it is stated that morphia and its salts are insoluble in that liquid, and then by new essays confirms his previous results, proving that M. St. Lager’s process cannot be followed.

The sulphate and hydrochlorate of morphia being but slightly soluble in fixed oils at the ordinary temperature, but more so when hot, M. Lepage recommends that the mixture of almond oil and hydrochlorate of morphia, should be heated just before it is to be used.

As a substitute for the “oil of morphia,” M. Soubeiran suggests a solution of morphia in glycerin, viz :

Acetate of Morphia,	six grains,
Glycerin,	a fluidounce.

Dissolve the morphia in the glycerin with or without heat.

*Mounsey’s Preston Salts.*—The following directions for making this preparation, are taken from the London Pharm. Journal, viz :



Take of True oil of cloves,  
English oil of lavender, of each a drachm.  
Oil of bergamot, five drachms,  
Strongest solution of ammonia, (sp. gr. .880) one pint,  
Mix these together. The bottles are then to be half filled with rough carbonate of ammonia, and filled up with the carbonate in fine powder. The salt is then saturated with the above solution, and corked closely.

*Oil of Protiodide of Iron.*—M. Gille of Paris has suggested that oil of almonds may be impregnated, to a certain extent, with protiodide of iron, provided the iodine, iron filings and the oil are mixed together, and shaken till the odor of iodine disappears, which requires several days.

The following is the formula suggested :

Take of pure iodine, in powder,	34 grains,
Iron filings,	230 grains,
Oil of almonds,	25 ounces, (Troy.)

These ingredients are mixed together, and agitated occasionally for several days. The oil of protiodide of iron, when complete, has a slight amber color, no odor and almost without taste. It preserves its physical and medicinal properties for some time without appreciable alteration, and should be kept in glass stoppered bottles.

In the *Annals of Pharmacy*, from which we extract this notice, it is not stated whether M. Gille proved the presence of iodide of iron in the oil. It is probable that some reaction occurs between the oil and iodine, prior to or coincident with its action on the iron.

*Nitro-tannate of Mercury.*—An eminent surgeon of Bordeaux, France, recommends an ointment made of an ounce of lard, *seventy-six* grains of tannin, and *twelve* drops of acid nitrate of mercury, as an application in certain forms of syphilitic ulcerations.

*Remedy for tooth-ache.*—Dr. Whipple, (*Amer. Journal of Dental Science*,) recommends oil of turpentine as a remedy for tooth-ache, applied on a pellet of cotton, and covered with dry cotton. It is particularly applicable in cases where the pain results from inflammation of the nerve, or from irritation caused by wounding the pulp.

*Cannabis Indica*.—The curious effects attributed to the extract and other preparations of the *Cannabis Indica*, as used in Egypt, has induced the “Société Medico Pratique de Paris” to offer a prize of one thousand francs for the best analysis of the Cannabis. The applicants for the prize are expected to send specimens of the principles they obtain, with a written memoir descriptive of the processes, &c., which must be in the French or Italian languages, and addressed to “M. Soubeiran, Secrétaire General de la Société de Pharmacie de Paris, Rue de l’Arbaleté 21” before the 1st of July, 1854.—(*Boston Med. and Surg. Jour.*)

*Oleo Resin of Male Fern*.—According to the *Monthly Journal*, Prof. Christison has directed attention to the ethereal oleo-resinous extract of male fern in the treatment of tape worm. Subsequently it had been tried by himself and others in twenty cases, and in no case did it fail after a single dose, to discharge the worm, and usually in one mass. The operation of the medicine, in most cases, was not attended with pain or uneasiness.

The dose varied from 18 to 24 grains; the latter has proved most effectual.

*Saccharated Iodide of Iron*.—The Hanover Pharmacopœia gives a formula for this preparation. Sixteen parts of iodine, four of iron filings, and 62 of water are gently heated together till the solution becomes green, when it is rapidly filtered, and mixed with 48 parts of pulverized sugar of milk. This mixture is then to be evaporated by means of a water-bath, until it acquires a thoroughly dry consistence. Thirty two parts of sugar of milk are then to be added, and the whole rubbed in a mortar into a fine powder. When properly made it is a yellowish white powder, soluble in seven parts of water, and requires to be kept in closely stopped bottles. This powder contains rather less than one per cent. of iodide of iron.

*Coating Pills*.—In the January number of this Journal, a process was given, as suggested by M. Calloud, for coating pills with mucilage of flaxseed and sugar. The same writer in the *Jour. de Chimie Médicale* for May, 1854, suggests a new material as preferable to flaxseed and sugar:

Take of Tragacanth, in pieces,	50. parts,
Distilled water,	100 “
Pure sugar of milk, in powder,	1000 “

Make a mucilage with the tragacanth and water, squeeze it through a linen cloth as in making lozenges, mix it with the sugar of milk to form a paste, spread this on plates, dry it in a stove and pulverize it. The pills are coated by moistening their surface with water and immediately rolling them in the powder. The moisture fixes a portion of the powder on their surface, and forms a coating.

*Ioduretted Oil.*—Some time since, M. Deschamps proposed an ioduretted oil, as a substitute for cod liver oil, which was made by dissolving iodine in almond oil, and passing steam through the solution until it became decolorized. M. Berthé, pharmacien of Paris, suggests that when so made the oil acquires a disagreeable rancid taste, and is liable to become black by standing; and proposes the following as a substitute. Triturate seventy-five grains of iodine, with thirty-two ounces of the oil of almonds, heat the mixture in a water bath until it becomes free from color, and does not affect damp starch paper. It is not acid, but becomes so by contact with moisture. M. Berthé considers it superior to all other ioduretted oils known, on account of its less disagreeable taste and easy preparation. It does not contain all the iodine employed in its preparation. It is considered preferable to operate in open vessels, as the oil made in close vessels becomes dark by keeping.

The dose is about the same as that of cod liver oil. M. Berthé has also prepared an *iodophosphuretted oil*, and M. Renault an *ioduretted albumen*, but doubts have been expressed in regard to their usefulness as medicinal agents. For further particulars relative to all these compounds, see the "Dublin Quarterly Journal of Medicine," and "Bulletin Général de Therapeutique."

*Means of removing the rancid odor of Fats.*—Dr. Griseler has accidentally made the observation, that an addition of nitric ether to rancid oil entirely destroys the disagreeable smell, and that when the oil is heated to separate the alcohol, it becomes clear and bright, even when it was before turbid. Dr. Griseler says, that a few drops of this liquid will prevent sweet fixed oils from becoming rancid.

## IODIDE OF SODIUM.

BY THE EDITOR.

Among the new remedies (or perhaps old remedies in new forms,) is iodide of sodium, which has been called for by several physicians in this city.

It may be economically and easily made by the following recipe :

Take of Iodine,	two ounces,
Iron filings,	an ounce,
Carbonate of Soda, in crystals,	two and a half ounces.
Water,	a sufficient quantity.

Mix the iodine with six fluidounces of water in a flask, add the iron filings, and agitate them together till the reaction ceases and all the iodine is combined; throw the whole on a filter, and when the solution has passed, wash the filter with water till the whole measures a pint. Dissolve the carbonate of soda in half a pint of water, and add it to the solution of iodide of iron, till it ceases to produce a precipitate of carbonate of iron; then heat the mixture nearly to the boiling point, filter and wash the residue on the filter with half a pint of water, and add it to the filtered liquid. Lastly, evaporate this in a porcelain capsule, till a pellicle begins to form, and set it aside to crystallize by cooling. Pour off the mother liquid from the crystals when formed, and again evaporate and crystallize.

Iodide of sodium, may also be made precisely as directed for iodide of potassium in the United States Pharmacopœia, substituting caustic soda for caustic potassa; but independent of the fact, that pure caustic soda is expensive, it is necessary in de-oxidizing the iodate of soda to avoid contact of air, else there is a loss of iodine with the formation of carbonate of soda.

Iodide of sodium obtained as above, by the cooling of a hot solution, crystallizes in white anhydrous cubes. When formed by spontaneous evaporation it contains 4 equiv. of water of crystallization. The crystals are striated oblique rhombic prisms, melt when gently warmed, and on being heated lose their water, leaving dry iodide of sodium. The hydrated iodide is more stable when exposed to the air than the anhydrous salt, but is more deliquescent, and very soluble. (*Gmelin.*)

## ON PREPARED CITRATE OF MAGNESIA.

BY CHARLES ELLIS.

The article which is the subject of this notice is called *Prepared Citrate of Magnesia*, to distinguish it from the soluble citrate, an account of which will be found in the American Journal of Pharmacy, vol. xxiv. page 115, by Edward Parrish.

Citrate of magnesia has within a comparatively short period of time been introduced into very general use. It is so destitute of bitterness or unpleasant taste that its preference as an aperient medicine over the nauseous potion of epsom salts is readily accounted for.

The liquid citrate which is so favorite a remedy with physicians, whenever a saline cathartic is indicated, is one of the most eligible preparations of its kind yet introduced to the notice of the faculty. It is in consequence of its popularity that enquiries have been made for an article of similar properties *in powder*.

To render the "soluble citrate" pleasant to the taste and capable of forming an effervescing solution when dissolved in water, it is necessary to combine with it sugar, and either bicarbonate of soda or potash, with the requisite quantity of citric or tartaric acid to decompose the latter.

If citric acid be used, care must be observed to dry it over a water bath, so as to deprive it of water of crystallization, previous to its combination with the alkaline bicarbonates.

The *prepared citrate of magnesia* is not recommended as equal to the *solution*, because the citrate in powder, however carefully prepared, is only slowly soluble in cold water, and does not readily make a clear solution.

When such a preparation, however, is wanted, the following formula is submitted as having been found in practice to answer the desired purpose.

The *soluble citrate* used is that made by the formula published in a previous volume of this Journal, and referred to in the first part of this notice.

Take Magnesiae citras,	℥iv.
Sacchari pulv.,	℥viij.
Acid citric, <i>vel</i> tartaric, pulv.,	℥iiss.
Soda bicarb.,	℥iij.
Ol. Limonis,	gtt. xx.

Combine the acid and sugar, and rub into a fine powder (if citric acid is used dry all the water out over a water bath,) add the *magnesiae citras* and *ol. limonis*, and mix intimately; then add the bicarb. of soda, and triturate the whole into a fine powder, which must be preserved in bottles properly excluded from the air. The dose for an adult is from one to three tablespoonfuls mixed in a tumbler of water, and drank in a state of effervescence.

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#### ON SOME DOUBLE SALTS OF IRON, AND THE RELATION OF SIMILAR SALTS TO THE ALUMS.

By MR. WILLIAM BASTICK.

It will be in the recollection of many members of the Society that on a recent occasion there was a discussion as to the number and variety of double salts, properly included under the generic term *alums*. By some it was argued that only the double salts formed by the combination of persulphate of alumina, persulphate of iron, persulphate of chromium, or persulphate of manganese, with sulphate of potash, sulphate of soda or sulphate of ammonia, crystallized in octohedrons with twenty-four equivalents of water, and could therefore be regarded as alums. By others it was assumed that, besides these double salts, the term might be applied with propriety to all the combinations of the before-mentioned persulphates, with the sulphates of magnesia, manganese, iron, zinc, copper, cobalt, and nickel. This assumption, although contrary to theory, has been supported by Sir Robert Kane and others, who have described some double salts formed of these metallic and earthy sulphates, in combination with persulphate of alumina, and who have applied the term *alums* to these double salts, because they possessed a similar constitution to the true alums, notwithstanding that their crystalline form belonged to the prismatic system. Now, I apprehend, that for any salts to come under the generic term *alums*, they must be isomorphous with the salt from which the genus alone derives its name, and that to be thus isomorphous it is absolutely necessary that the salts should possess the same crystalline form, and replace each other in combination without any material alteration in their crystalline structure. If these positions be true, however much the so-called alums described by Kane and others may agree in

their chemical composition with the true alums, they cannot be regarded as, or termed alums, because their physical conformation and properties do not satisfy the conditions required by the isomorphous theory. With a view of ascertaining whether some of the metallic sulphates might, in combination with some other persulphate than that already experimented upon by Kane and others, form salts isomorphous with the true alums, I prepared and examined the following double salts of iron :

*Persulphate of Iron and Sulphate of Copper.*—This salt was formed by adding in equivalent proportion sulphate of copper to a solution of persulphate of iron, containing an excess of acid, and evaporating the mixture until a pellicle formed on the surface, when the solution was set aside to crystallize. By these means a bluish-green salt was obtained in considerable quantity, whose crystalline form could only be clearly observed by the aid of the microscope, which proved that this salt does not crystallize octohedrons, but in wart-like masses, consisting of prisms, and therefore is not isomorphous with the true alums. This salt very readily effloresces when exposed to the air ; consequently it is difficult to be preserved, or to be correctly analysed, and this difficulty is increased because it is contaminated with free acid, which is not easily removed, as it cannot be crystallized except from a strongly acid solution. Notwithstanding these disadvantages I dried as far as possible a portion of the salt for analysis by subjecting it to repeated strong pressure, between the folds of bibulous paper. 2.9 grammes of this salt thus treated yielded sulphate of baryta = .95 gramme of anhydrous sulphuric acid, and 5.6 grammes gave .43 gramme of oxyde of copper and .87 gramme of peroxyde of iron, and its water was estimated from the loss. The following table will show these quantities reckoned in per cent., and also the calculated constitution of the salt :—

		Calculated.	Found.
Cu O	40	8.07	7.67
Fe <sub>2</sub> O <sub>3</sub>	80	16.13	15.53
3 SO <sub>3</sub>	160	32.26	32.76
24 HO	216	43.54	44.04
	<hr/> 496	<hr/> 100.00	<hr/> 100.00



It will be here seen that this salt has the same chemical constitution as the alums, namely,  $\text{Fe}_2 \text{O}_3, 3 \text{SO}_3 + \text{Cu O SO}_3, + 24 \text{H}_2\text{O}$ , but differs entirely in its crystalline structure—in fact, so much so, as not to admit of its form being derivable from, or convertible into, that of the true alums.

*Persulphate of Iron and Sulphate of Zinc.*—This salt was prepared in exactly the same manner as the one previously described. It crystallizes in white transparent prisms, and corresponds to the double copper salt in all its characteristics; and although it was not submitted to an exact quantitative analysis, its examination left no doubt but that it has a similar constitution to that of the persulphate of iron and sulphate of copper.

*Persulphate of Iron and Sulphate of Magnesia.*—This salt, prepared as the other salts, crystallized in warty masses, consisting of prisms, and corresponds to them in its chemical and physical properties.

It is evident that the number of these salts may be multiplied to an almost endless extent, and it is equally evident, if we may presume to generalize upon the facts before us, that the multiplication of these salts would serve to further prove the impropriety and inconvenience of applying the term alums to such salts, for the pseudo-alums would then greatly outnumber the true alums. It seems from the experiments of Will and Ortigosa that the number of the true alums may be increased, if it be desirable to do so, by replacing the ammonia or potash of the double sulphates of alumina, manganese, chrome, and iron, with organic bases, by which means compounds may probably be made likely to be interesting and valuable both to the physician and the pharmacist.—*London Pharm. Jour.*, June, 1854.

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## MANUFACTURE AND CONSUMPTION OF QUININE IN THE UNITED STATES.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

SIR,—An article in your last number on the Manufacture and Consumption of Quinine in the United States, claims notice, from the circumstance of its appearing in a journal of so much authority as yours. In its original form of a letter to a newspaper, it would have been noticed only as an advertisement, but

as it raises a question affecting the European makers of this important medicine, I hope you will allow me space for a few observations.

The different medicinal effects of the alkaloids obtained from cinchona barks (I refer especially to quinine, quinidine, and cinchonine) deserve a more careful study than has yet been bestowed upon them, in this country at least.\* Results well worth the trial might also be obtained by their exhibition in combination, as is so often practised with other medicinal substances. The barks most valued for medicinal use as such, vary greatly in their active constituents. The species which first came into notice (cinchona condaminea) is extremely rich in alkaloids, containing large quantities of each of the three above mentioned, besides their uncrystallizable modifications.

In the mean time one very important principle must by no means be lost sight of, that a practitioner should always know what he is administering, and on this ground the substitution of even a more efficacious remedy under the old name would be totally unwarrantable.

To turn then to the question of quinine as at present in the market.

I should observe that it is only the genus Cinchona, as defined by the accurate and indefatigable Mr. Weddell, which has been proved to afford any of the above-mentioned alkaloids, the genera most nearly allied, and which at first sight resemble the cinchona most closely, being apparently quite destitute of them. Of this genus the species and varieties are extremely numerous, and all investigation only brings continually new ones into view.

The "Monopoly," or best Bolivian Yellow Bark, consists of two at least, and probably three, distinct species, of nearly equal commercial value, besides an occasional admixture of spurious sorts. These species are the Cinchona Calisaya (three or four

\*I beg to refer to a very laborious and valuable work published last year by M. Briquet, "*Traite Therapeutique der Quinquina et de ses Preparations.*" This author, however, was not acquainted with quinidine. He estimates cinchonine as one-third or one-fourth weaker than quinine, a result which he says is confirmed by observers, who have been obliged to give sixty for eighty centigrammes of cinchonine, to arrest fever which would have yielded to forty or fifty centigrammes of sulphate of quinine.

varieties,) Boliviana, and ovata, var. rufinervis. These all contain quinine, quinidine, and cinchonine, but the two latter alkaloids in small quantity. Other species present them in very different proportions, sometimes one, sometimes another forming the chief part of the febrifuge constituents. In some the bitter taste of the bark appears to be due, not to any of these, but to a curious acid, the kinovic, which, like the fatty acids, is very sparingly soluble in water, but possesses a strong bitter taste, especially when combined with alkalis.

It is obvious that the extraction of the quinine from these barks may be much more troublesome in one case than in another; but, in the first place, *the quinine contained in them is identical in all*. I do not speak only of its giving identical results by ultimate analysis—all its chemical properties—its solubility in a certain quantity of hot or cold water, ether, alcohol, and other solvents—its behavior with different re-agents—its powers of forming the artificial tourmalines, discovered by Dr. Herapath, and of giving the other optical results which have justly gained an European celebrity for their discoverer—its physical properties of taste, form of crystal, &c., all are precisely identical, from whatever species obtained. In fact, it would be as “scientific” to question whether gold from California and from Australia were the same thing, because one was found in combination with more silver than the other, as to admit the doubts suggested by the paper to which I refer.

Secondly. No very delicate operations are required to separate these alkaloids, so as to obtain each in a state sufficiently pure for all practical purposes.

Thirdly. The tests in common use, already described in your Journal, are amply sufficient to ascertain whether the care needed to secure this result has been taken in the manufacture.

I remain, yours respectfully,

*Ibid.*]

ROBERT HOWARD.

## ON LUPULINE.

By J. PERSONNE.

Lupuline is the yellow powder so readily obtained by rubbing the catkins of hops. To this powder the peculiar properties of

the hops, their bitterness and aroma, are due. It has been investigated by D. Ives, of New York, and by Payen and Chevalier. (Also by Dr. Rudolph Wagner.)

Lupuline furnishes both volatile and non-volatile bodies to boiling water. When distilled with water, an acid and an essential oil pass over as volatile constituents. The non-volatile substances are an organic acid and nitrogenous bitter matter, both of which are soluble in water. The author has not investigated these any further.

The *volatile acid*, determined by the analysis of the salts of silver, baryta and copper, is valerianic acid, of which lupuline contains about one per cent.

The *volatile oil* is lighter than water, becomes resinified in the air, and acquires acid properties. The boiling-point rises from 284° to 572° F. By fractional distillation, the author separated it into two different oils. One boils between 302°–320° F., the other at 572° F. Both have the constitution  $C^{22}H^{18}O^2$ ; they turn the plane of polarization to the right, and do not solidify at 0° F. Concentrated sulphuric acid dissolves them with a red color; they are again separated by water, and the sulphuric acid then furnishes with baryta a salt of a conjugate sulpho-acid; nitric acid converts them partly into resin and partly into valerianic acid. If let fall in drops upon hydrate of potash, they are converted into a hydrocarbon of the formula  $C^{10}H^8$ , with formation of carbonic and valerianic acids. If this hydrocarbon be deducted from the oil,  $C^{22}H^{18}O^2 - C^{10}H^8 = C^{12}H^{10}O^2$ , the latter expresses the valerole which Gerhardt prepared from valerianic acid. The hydrocarbon of the oil of hops, however, furnishes no Borneo camphor, and it also has a smell more like that of thymene.

The large quantity of resin contained in lupuline renders it difficult to obtain valerole from it. The solid resinous mass left after exhaustion with water consequently still contains much of this substance. If it be distilled with lime, taking care that it is not carbonized, Chancel's aldehyde of valerianic acid goes over; its composition is  $C^{10}H^{10}O^2$ . It boils at 194° F., and is rendered brown and resinous by potash, and very readily reduces salts of silver. Its specific gravity was 0.8009 at 68° F.—*London Chem. Gaz. from Comptes Rendus.*

## ON THE OIL OF OSMITOPSIS ASTERISCOIDES.

By E. VON GORUP-BESANEZ.

Martius received from Cape Town an oil denominated "essential oil of *Osmites Bellidiastrum*," accompanied by a specimen of the plant from which it had been obtained. This plant was determined by Schnitzlein to be *Osmitopsis asteriscoides*; it belongs to the family of Senecioid *Compositæ*.

The oil is a thin fluid, yellow, with a tinge of green; it feels rough between the fingers, has a penetrating but not unpleasant odor, something like camphor and cajeput-oil, and a burning taste, somewhat acrid in the throat; it is neutral. Its specific gravity at 62°·15 F. is 0·931. It is insoluble in water, ether and alcohol; iodine dissolves in it without explosion; concentrated sulphuric acid gives it a brown color; nitric acid thickens the oil, and produces a violent evolution of NO<sup>4</sup>. Potassium becomes oxidized in it, with a slight-evolution of gas. It furnishes no metallic speculum with an ammoniacal solution of silver, nor does it form a crystalline compound with alkaline sulphites. It is free from sulphur.

It began to boil at 350° F.; the boiling point then rose to 354° F., and afterwards, between 370° and 404° F., a yellowish oil passed over; at 404°–408° F. a crystalline sublimate was formed in the neck of the retort.

The oil which passed over between 354° and 370° F. possessed a much finer odor than the original oil. A portion obtained by rectification, which boiled between 354° and 362° F., was analysed. Its spec. grav.=0·921.

The oil of the *Osmitopsis* is C<sup>20</sup> H<sup>18</sup> O<sup>2</sup>, and consequently isomeric with Borneo camphor, cajeput oil, &c., a relationship which Martius had already suspected. Analysis gave:—

Carbon	.	.	77·36	20 = 120	77·92
Hydrogen	.	.	11·53	18    18	11·69
Oxygen	.	.	11·11	2     16	10·39

London. Chem. Gaz., from Ann. der Chem. und Pharm.

## PATENT GRANTED TO F. M. LYTE, FOR IMPROVEMENTS IN OBTAINING IODIDE OF POTASSIUM, WHEN TREATING CERTAIN METALS.

This invention consists in the discovery, that when the chlorides, or some soluble salts of certain metals are placed in contact with solutions containing mixed iodides and chlorides, double decomposition ensues, and insoluble metallic iodides are formed, and that, by continuing the addition of the chlorides, this continues so long as any soluble iodide remains in the solution; also that the insoluble iodide can afterwards be converted into a metal and a soluble iodide by any of the processes in use at present for the decomposition of metallic chlorides, as in refining silver. For instance, the patentee refines silver, and at the same time produces iodide of potassium from such solutions as bittern, or matters which contain these mixed iodides and chlorides. Having dissolved the silver in nitric acid, and precipitated it with a soluble chloride, as chloride of silver, he divests it of copper by washing with water. He then projects the chloride so produced into the solution of mixed chlorides and iodides, and continues the addition, with frequent stirring, till, on adding a portion of the chloride of silver to a test-sample of the liquid, it ceases to become yellow. Then, to ensure all the silver being converted into iodide, he adds a very small portion more of the mixed salts, so that there may be a small excess of iodine in the solution, rather than a trace of chlorine in the precipitate. The addition of ammonia facilitates the decomposition; so also does heating the liquid. The iodide of silver thus produced is converted into iodide of potassium and metallic silver by projecting it when completely desiccated, into a crucible containing fused carbonate of potash, according to the method now in use for the reduction of the chloride; but by this process iodide of potassium is formed, instead of the chloride as formerly,—a valuable product, instead of a product of little value.

By adding a soluble salt of lead to the mixed salts till all the iodine is precipitated, and decomposing the iodide thus formed by the same method, iodide of potassium is formed, which may be dissolved and purified by recrystallization.

The periodide of mercury (a most splendid pigment) is produced by adding the bichloride of mercury to the mixed salts.

By these methods all the iodine is recoverable from the mixed salts; whereas by the old process generally used, a great deal was lost as chloride of iodine.—Sealed July 26, 1853.—*London Chem. Gaz.* April 15, 1854.

## CONTRIBUTIONS TO THE HISTORY OF THE FATTY BODIES.

BY J. LEFORT.

In a former memoir, the author communicated his views on the composition of the fatty vegetable oils, and their behaviour with iodine, chlorine and bromine. He has since endeavored to ascertain whether these elements do not act specially upon one of the constituents of the oils, as, for example, upon the oleine, rather than upon the margarine and stearine. He has arrived at the following results:—

Iodine, whose only action upon the fatty oils consists in depriving them of a very small portion of the hydrogen, does not appear to affect the oleine in any greater degree than the margarine and stearine. Chlorine and bromine, on the contrary, combine very readily with all three principles.

These new compounds are heavier than water; chlorinated and brominated oleine are thicker than pure oleine, whilst the corresponding compounds of margarine and stearine do not possess so much consistency as the pure substances, and fuse at a much lower temperature. No reagent shows the presence of free bromine and chlorine in these compounds.

Stearine, margarine and oleine, under the influence of chlorine and bromine, lose the same quantity of hydrogen, which in the case of the first, the only one of which the exact composition is known, is 4 equivs. The author gives the formula  $C^{76} H^{66} Cl^4 O^3$  for chlorinated stearine, and for brominated stearine  $C^{76} H^{66} Br^4 O^3$ . In the case of margarine and oleine, also, the chlorine and bromine would likewise displace 4 equivs. of hydrogen.

The author has also instituted some experiments on the action of the haloid elements upon the fatty acids.

Iodine has no action upon the fatty acids produced by the saponification of either the vegetable or animal oils. Chlorine and bromine also form no peculiar compounds with stearic and margaric acids if these be completely freed from oleic acid;



small quantities of the elements are dissolved by the fatty acids, but no hydrochloric or hydrobromic acids are produced. Oleic acid, on the contrary, is readily acted upon, and furnishes the following compounds:—

*Chlorinated Oleic Acid.*—It is liquid at ordinary temperatures, heavier than water, and possesses a very strong brown color; it produces no precipitate with nitrate of silver. Its consistence is a little greater than that of the pure acid; its specific gravity, at a temperature of  $46^{\circ}$  F., is 1.082; it boils at  $374^{\circ}$  F. Its formula is  $C^{36} H^{32} Cl^2 O^4$ .

*Brominated Oleic Acid.*—This possesses about the same consistence as the preceding; its color is a darker brown, although reagents give no sign of the presence of free bromine when it has been well washed and not kept too long. Its specific gravity at a temperature of  $45^{\circ}.5$  F., is 1.282; it boils at  $392^{\circ}$  F. Its analysis gave numbers agreeing with the formula  $C^{36} H^{32} Br^2 O^4$ .

The author considers that stearine and margarine belong to the class of isomeric compounds, and that the vegetable fatty oils are compounds in definite proportions of oleine and margarine, or perhaps rather oleo margarates of glycerine, the resolution of which may be affected by the most feeble agents.—*London Chem. Gaz., from the Comptus Rendus*, xxxvii., p. 28.

## ON THE NITRATES OF IRON.

By S. HAUSMANN.

The author has carefully investigated Schönbein's nitrate of iron in Fresenius's laboratory. The acid nitrate of iron was prepared by evaporating the reddish-brown solution of iron in nitric acid to the consistence of a syrup, and then adding half its volume in nitric acid. The crystals which form are—

*Neutral Nitrate of Iron*,  $Fe^2 O^3, 3NO^5 + 12HO$ .—Prismatic crystals, fusing at  $95^{\circ}$  F. Ordway (*Chem. Gaz.*, vol. viii. p. 61) gave the formula  $Fe^2 O^3, 3NO^5 + 18HO$  for it. Analysis:—

$Fe^2 O^3$	.	.	21.47	1 =	80	22.85
$NO^5$	.	.	46.78	3	162	46.29
$HO$	.	.	31.75	12	108	30.86

When the very concentrated solution of nitrate of iron is mixed with as much water as will reduce its dark red color to a

pale reddish-yellow, boiled and mixed, after cooling, with nitric acid, we obtain the

*Basic Salt*,  $8\text{Fe}^2\text{O}^3, 2\text{NO}^5, 3\text{HO}$ , in the form of an ochre-yellow precipitate, which is difficult of solution in cold dilute acid, but dissolves readily in water, forming a deep red fluid. The salt, washed with water, containing nitric acid, furnished on analysis—

$\text{Fe}^2\text{O}^3$	.	.	81.92	8	= 640	82.58
$\text{NO}^5$	.	.	14.47	2	108	13.93
$\text{HO}$	.	.	3.61	3	27	3.49

*Basic Salt*,  $36\text{Fe}^2\text{O}^3, \text{NO}^5+48\text{HO}$ .—When the concentrated solution of nitrate of iron, containing a little excess of acid, is boiled for a considerable time, a precipitate resembling the preceding is formed; its analysis gave—

$\text{Fe}^2\text{O}^3$	.	.	85.44	36	= 2880
$\text{NO}^5$	.	.	1.61	1	54
$\text{HO}$	.	.	12.95	48	432

*Basic Salt*,  $8\text{Fe}^2\text{O}^3, \text{NO}^5+12\text{HO}$ , was obtained by treating an excess of iron with nitric acid; it forms a rust-colored precipitate, which is difficult of solution in nitric acid, but dissolves more readily in water. Its analysis gave—

$\text{Fe}^2\text{O}^3$	.	.	80.33	8	= 640	79.81
$\text{NO}^5$	.	.	6.19	1	54	6.73
$\text{H}$	.	.	13.48	12	108	13.46

*London Chem. Gaz., June 1, from Ann. der Chem. und Pharm.*

## ON THE PREPARATION OF DAMMARA VARNISH.

BY W. MUNSEL.

If dammara resin be dissolved in cold oil of turpentine, a milk-white turbid varnish is obtained; this turbidity, however, does not depend upon the incomplete solution of the resin, but rather upon the moisture adherent to it. This moisture, as well as the water enclosed in the interior of the resin, especially in the white opake pieces, produces many defects in the varnish, as when it is prepared cold this water remains in it in a finely-divided state. When such a varnish as this is laid on, the water contained in it, although in such small quantity, can neither evaporate nor soak into the varnished object; and thus these

minute water-bubbles produce a dull, rough appearance on the surface of the varnish, so that the latter can never produce a truly glass-like coating. At every change of temperature, these watery particles either expand or contract, until at last, from frequent repetition of this process, or in consequence of a greater elevation of temperature than usual, the coat of varnish bursts or cracks, and falls off as a scaly powder. In order to get rid of this defect entirely, the water adherent to the resin must be completely removed. This is best done by boiling the resin with the oil of turpentine in an open vessel, as in this case the water enclosed in the resin is dissipated below the boiling point of the oil. The object is equally attained when the resin is well dried in a drying oven before solution, and then dissolved in cold oil of turpentine; if the resin were sufficiently dried, a perfectly clear and transparent varnish is obtained, possessing all the properties of a good varnish; this mode of preparation, however, from its complicated nature, is not to be recommended for adoption on the large scale. If a very small quantity of water be added designedly to a perfectly clear and well-boiled varnish, and the whole is shaken, the latter immediately acquires the turbid appearance, and all the properties of a bad varnish.

In the preparation of dammara varnish, the author employs enamelled cast-iron pots, capable of containing about 50 lbs.; in these, 25 to 30 lbs. of varnish may be conveniently prepared. The dammara resin is put into the pots in a solid state (the powdering of the resin is disadvantageous, as when in this state it forms a mass during the fusion, and the varnish thus generally acquires a color), the proper quantity of turpentine (5 parts to 4 parts of resin) is then poured to it, and the whole put upon the fire. As soon as the boiling of the oil begins, the water originally included in the resin is dissipated in the form of vapor, and the resin acquires a softer consistence. When all the water is expelled and the oil (or varnish) boils quietly, the solution is completed, and the vessel may be removed from the fire. As long as even traces of water exist in the varnish, its boiling is attended with a bubbling movement; but as soon as all the water is got rid of, the varnish boils quite quietly. That even a very small quantity of water is sufficient to produce this bubbling, may be shown by blowing with the mouth into some quietly-boil-

ing varnish, when the mass immediately appears ready to boil over, entirely in consequence of the slight moisture introduced into it by the breath.

When the varnish is prepared, it is poured through a fine wire sieve, and then allowed to settle sufficiently. Filtration through pointed bags, as recommended by Miller, appears to the author to take up a great deal too much time, is unquestionably attended with loss, and does not lead to the desired object so well as standing quietly.

By this method, two workmen in the author's factory prepare 4-5 cwt. of good varnish per day.

If it be desired to give the varnish a tougher consistence, 2-3 per cent. of good bleached linseed-oil (not boiled with oxide of lead) must be added to it before boiling. This communicates great toughness to it, and it then resists friction, &c. much better.—*Ibid*, from *Polytechnisches Centralbl.*, 1854, p. 168.

## ON THE PREPARATION OF IODIDE OF POTASSIUM.

By A. OVERBECK.

The author gives the following prescription for the preparation of iodide of potassium :—

Iodide of formyle is prepared from 3 equivs. alcohol, 6 equivs. iodine, and 5 equivs. potash. If 4 equivs. of iodine be employed to  $C^4 H^6 O^2$ , the mass thickens too much by separation of the iodide of formyle produced, so that the greater addition of alcohol is very essential to the facilitation of the operation. This is performed in the following manner :—

The necessary quantity of watery alcohol ( $C^4 H^5 O$ , HO) is first gently heated in a beaker or flask; the dry iodine and the potash (the latter dissolved in as little water as possible) are then alternately added, in such a manner that before each addition of iodine the solution is completely decolorized. The iodide of formyle produced separates for the most part during the operation in citron-yellow laminæ; its complete separation is effected by pouring over it 20 times as much water as there was alcohol employed; the whole is then collected on a filter, pressed between blotting-paper, and boiled with solution of potash (1 equiv. of

iodide of formyle to 4 equivs. potash) until it is completely decomposed into formiate of potash and iodide of potassium.

This fluid, mixed with that filtered from the iodide of formyle, is now evaporated to dryness, then mixed with some powdered charcoal (for the more ready decomposition of any iodate of potash that may have been formed), and heated to redness; the mass, which contains iodide of potassium and carbonate of potash, is then extracted either directly with alcohol, or with water after neutralization by hydriodic acid. Pure iodide of potassium is obtained by crystallization from either of these extracts.—*Ibid*, from *Archiv der Pharm.*, lxxvii. p. 8.

#### COCOA NUT OIL A SUBSTITUTE FOR COD LIVER OIL.

From experiments made by Dr. T. Thompson, on the effects produced upon the human system in disease by the administration of cocoa nut oil, he is led to believe that it may prove to be a very efficient substitute for cod liver oil. He has communicated the results of his experiments in a paper lately read before the Royal Society, entitled, "On Changes produced in the Blood by the Administration of Cod Liver Oil and Cocoa Nut Oil," in which he states, that the use of almond oil, and of olive oil, was not followed by any perceptible remedial effects; whereas, from the cocoa nut oil, results were obtained almost as decided as from cod liver oil; and, therefore, he believes the former oil may hereafter prove to be a most useful substitute for the latter oil. The cocoa nut oil he employed was a pure cocoa oleine, obtained by pressure from crude cocoa nut oil, as expressed in Ceylon and the coast of Malabar, from the dried cocoa nut kernels, and refined by being treated with an alkali, and then repeatedly washed with distilled water. This oil burns with a blue flame, thus indicating a comparatively small proportion of carbon in its constitution. It is being brought forcibly beneath the notice of medical practitioners, as may be seen by announcements of it in the many periodicals, specially devoted to the communication of medical and therapeutical intelligence; nor is this surprising, when the very large consumption of cod liver oil, for which this is proposed as a substitute, is taken into account.—*Annals of Pharmacy*, June, 1854.

ON THE MANUFACTURE OF CITRIC ACID, CITRATE OF LIME,  
CITRATE OF BARYTA, &c.\*

In the ordinary method of manufacturing citric acid, lime-juice is saturated with chalk, and the insoluble citrate of lime, thus formed, is decomposed by sulphuric acid; citric acid is thus set at liberty. In this process the mucilaginous and other organic matters contained in the lime-juice, are to a great extent precipitated with the citrate of lime. These foreign matters, on the subsequent decomposition of the citrate of lime by sulphuric acid, contaminate the solution of citric acid obtained, and render it necessary for the manufacturer to have recourse to a great number of crystallizations, in order to procure the whole of the citric acid in a marketable state.

In order to destroy much of this mucilage and other organic matter, it has been recommended to bleach the washed citrate of lime by exposure in shallow vessels to the action of the sun's rays, covered by a weak solution of chloride of lime. In a few hours, it is stated, decoloration takes place, with the destruction of much of the foreign matter previously mixed with the citrate, and thus much of the after labor and expense of repeated crystallization is saved to the manufacturer.

Dr. Price's new process consists in combining the citric acid contained in lemon or lime-juice, or other impure solution of citric acid, with potash, soda, or ammonia, so as to obtain *soluble* citrates, and after separating any insoluble impurities which may be present, or which may rise in neutralization from the said neutral solution by filtration or decantation, he decomposes the said solution with salts of lime, baryta, or strontia, so as to obtain pure or nearly pure citrate of lime, or citrate of baryta, or citrates of strontia, and ammonia, or salts of ammonia, or salts of potash or of soda. The citrate of lime, or citrate of baryta or strontia, is decomposed by sulphuric acid in the usual manner, the citric acid crystallized, and the ammonia, or salts of ammonia, or salts of potash or of soda, contained in the solution from which the citrate of lime has been precipitated, may be recovered by crystallization or otherwise.

The mode of procedure in carrying out this process is as follows:

\* By the Editor of the London Pharmaceutical Journal.

Into crude lemon or lime-juice, or other solution containing citric acid, the volatile compounds contained in gas-liquor are distilled until the said juice or solution is neutralized, or the said juice or solution is neutralized with gas-liquor, or with ammonia or its carbonates, or with sulphides of ammonium, obtained as hereafter described; and the neutralized solution, being filtered from the insoluble impurities, the solution of citrate of ammonia thus obtained, is decomposed in the following manner:—The solution is placed in a distillatory apparatus, and to it there is added 150 parts by weight of carbonate of lime, powdered, and made into a paste with water, or 90 parts by weight of lime slacked, and made into milk of lime, to every 192 parts by weight of citric acid existing in solution as citrate of ammonia. Heat is then applied, and the said solution of citrate of ammonia is decomposed into citrate of lime and into carbonate of, or free, ammonia, which may be conducted into a fresh quantity of lemon or lime-juice, or other solution containing citric acid, so as to neutralize the same, which solution, when neutral, or better when alkaline, may be treated as last described. The citrate of lime, thus obtained, is to be decomposed with sulphuric acid, as is now done in the ordinary manufacture of citric acid, and the solution of the liberated citric acid filtered from the sulphate of lime, evaporated and crystallized. The solution of citrate of ammonia, obtained as first above described, may be treated with either chloride of calcium or sulphate of lime. For this purpose the solution of citrate of ammonia is boiled with either of the salts of lime, viz., chloride of calcium or sulphate of lime, until the citrate of ammonia, previously existing in solution, is decomposed, and citrate of lime and either sulphate of ammonia or chloride of ammonium obtained, the decomposition of the said citrate of ammonia being conducted in the same manner and with the same precautions as after described, with reference to improvements in the manufacture of tartaric acid.

The solution of citrate of ammonia, obtained as first above described, may be decomposed with sulphide or sulphides of calcium, or soda waste (oxysulphide of calcium,) or sulphide of barium, or of strontium, the said solution being contained in a distillatory apparatus, and the decomposition being conducted in the manner before described.

The citric acid existing in lemon-juice, or other solution, may be combined with potash or soda instead of ammonia, and the



resulting solution of citrate of potash or soda be decomposed with either salts of lime or baryta, as follows:—The lemon or lime-juice, or solution containing citric acid, having been placed in a convenient vessel, a solution of sulphide or sulphides of potassium is added, with application of heat, until the whole of the citric acid is converted into citrate of potash, which may be known by the solution becoming neutral or slightly alkaline. The solution of citrate of potash thus obtained, being filtered from the insoluble impurities and placed in a suitable vessel, is decomposed by means of sulphate of lime or a solution of chloride of barium or chloride of calcium, or of nitrate of lime, or of nitrate of baryta, or chloride of strontium, or nitrate of strontia, in a manner similar to that at present adopted for decomposing tartrate of potash by means of sulphate of lime or chloride of calcium in the manufacture of tartaric acid. The citrate of lime thus produced, may be separated by decantation or filtration, and the solution containing the salts of potash, viz., either chloride of potassium, nitrate of potash, or sulphate of potash, evaporated in a convenient evaporating vessel. The salts of potash, thus obtained, if mixed with any impurities, may be recrystallized, so as to be rendered marketable.

In employing the salts of lime or baryta to decompose citrate of potash, citrate of soda or citrate of ammonia, solutions either saturated or partially so may be employed, or sulphate of lime in small crystals or powder may be used in the following proportions: viz., to every 192 parts by weight of citric acid, previously existing in lemon-juice or lime-juice, or contained in other solutions, and now existing as citrate of potash, citrate of soda, or citrate of ammonia, there may be added in parts by weight as follows:—246 parts of nitrate of lime, or 318 parts of nitrate of strontia, or 168 parts of chloride of calcium, or 240 parts of chloride of strontium, or 390 parts of nitrate of baryta, or 312 parts of chloride of barium, actually contained in solution or otherwise, or 258 parts of sulphate of lime.

Dr. Price also employs sulphide or sulphides of sodium to neutralize citric acid. This may be employed in a manner similar to that described for saturating citric acid with sulphate of potassium, and after having separated by decantation or by filtration the insoluble impurities, he decomposes the said solution of citrate of soda with sulphate of lime, in a manner similar to

that described for decomposing citrate of potash with salts of lime, and with the same amount of sulphate of lime as there employed. The citrate of lime produced is separated, and the sulphate of soda existing in solution may be obtained by evaporation and crystallization.

The salts of baryta, strontia, and lime, which are to be employed in decomposing citrate of potash, may be employed to decompose citrate of soda, and may be employed in a similar manner and in the same proportions as when employed to decompose solutions of citrate of potash. The citrate of lime and citrate of baryta or strontia resulting, may be decomposed by means of sulphuric acid in the same manner as citrate of lime is now decomposed in the manufacture of citric acid, and citric acid be therefrom obtained. The sulphide of potassium and the sulphide of sodium employed, may be obtained by heating a mixture of either sulphate of potash or sulphate of soda with small coal, coal-dust, or powdered charcoal, in a reverberatory furnace, or otherwise, until the whole or the greater proportion of the sulphate of potash or sulphate of soda is reduced and converted into sulphide of potassium and sulphide of sodium. These sulphides being soluble in water, they may either be employed in solution, or the fused mass may be used direct, or these sulphides may be obtained from other sources.—*London Pharmaceutical Journal*, Jan. 1854.

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MANUFACTURE OF TARTARIC ACID, PURIFIED BITARTRATE OF POTASH, BIOXALATE OF POTASH, TARTRATE OF SODA AND POTASH, AND CARBONATES OF SODA AND POTASH.\*

In the ordinary mode of obtaining tartaric acid, the excess of acid, existing in crude bitartrate of potash (argols and tartar) is neutralized with chalk, with the formation of insoluble tartrate of lime and soluble tartrate of potash. The latter salt is then decomposed by the agency of sulphate of lime, and a further portion of tartrate of lime is thus formed. In this case, as in that of the citrate of lime before mentioned, much of the organic coloring matters present are precipitated with the tartrate

\* By the Editor of the London Pharmaceutical Journal.

of lime, and on the subsequent decomposition of this salt by means of sulphuric acid, the tartaric acid set free is contaminated by the presence of these foreign matters, and the manufacturer is obliged, as in the case of citric acid, to resort to several crystallizations in order to obtain the whole of the acid in a state fit for the market.

Dr. Price's improvements in the manufacture of tartaric acid consist in combining bitartrate of potash with ammonia, so as to form tartrate of ammonia and potash, which may be effected, either by neutralizing impure bitartrate of potash or crude argol or crude tartar with gas-liquor or with a solution of ammonia, or with carbonate of ammonia, or sulphides of ammonium, obtained by decomposing tartrate or citrate of ammonia with hydrated caustic lime or carbonate of lime, or sulphides of calcium, or sulphides of barium or strontium, or with condensed volatile salts of ammonia, obtained by distilling gas-liquor or ammoniacal liquors. Impure bitartrate of potash being placed, with or without water, in a suitable and convenient vessel, a solution of ammonia or of salts of ammonia is added until the whole of the bitartrate of potash existing in the crude tartar or argol is neutralized, and a solution obtained of tartrate of potash and ammonia, which solution is to be separated by filtration or decantation from any insoluble impurities. The solution of tartrate of potash and ammonia, thus obtained, may be treated by either of the following processes:—To the tartrate of potash and ammonia a solution of chloride of calcium is added, until the whole of the tartrate of potash and ammonia is decomposed; that is to say, that for every 188 parts of bitartrate of potash existing in the crude argol or tartar, and now existing in solution as tartrate of potash and ammonia, a solution of chloride of calcium, corresponding to 112 parts of chloride of calcium, are to be added, with application of heat to the mixed solutions. The solution of chloride of potassium and ammonium is separated from the tartrate of lime produced, by decantation or filtration, and the solution containing chloride of potassium and chloride of ammonium is to be evaporated, care being taken that the solution be kept alkaline or neutral by the addition of either of the above mentioned ammoniacal salts or ammonia. The tartrate of lime deposited, during the evaporation is to be separated, and

the chlorides of potassium and ammonium in the solution separated by evaporation and crystallization. The mother-liquors, containing chlorides of ammonium and potassium, together with the tartrate of lime, are to be evaporated, and the tartrate of lime which deposits separated, or the mother-liquors may be evaporated to dryness, and the chlorides of potassium and ammonium be dissolved in water and filtered. The tartrate of lime left, together with that previously separated, is to be collected, and may be decomposed in the usual manner with sulphuric acid, and tartaric acid be obtained therefrom. The chloride of ammonium and chloride of potassium in the solution may be evaporated down and crystallized either together or separately.

Or, instead of the above process, the tartrate of ammonia and potash may be decomposed by boiling a solution of the same with sulphate of lime until the whole of the tartrate of potash and ammonia is decomposed into tartrate of lime and sulphate of potash and sulphate of ammonia. These may be separated in a manner similar to that described for effecting the separation of chloride of potassium and chloride of ammonium from tartrate of lime. The tartrate of lime obtained, after separating the sulphate of potash and sulphate of ammonia, may be decomposed in the usual manner by means of sulphuric acid, and after separation from the resulting sulphate of lime, and by evaporation and crystallization, the tartaric acid is fit for use.

Or, tartrate of potash and ammonia may be decomposed by treating a solution of the same, contained in any suitable distillatory apparatus, with carbonate of lime or hydrated caustic lime, and in the proportion of 60 parts by weight of carbonate of lime, ground, and made into a paste with water, or 30 parts by weight of lime slacked, and made into milk of lime, or with 36 parts of sulphide of calcium, or 36 parts by weight of soda waste, "oxysulphide of calcium," or 85 parts by weight of sulphide of barium, or 60 parts by weight of sulphide of strontium, for every 188 parts of bitartrate of potash previously existing in the crude argol or crude tartar, and now contained in solution as tartrate of potash and ammonia. Heat is to be applied, and the volatile ammoniacal products which distil off are to be collected, and may be employed for dissolving and neutralizing an additional quantity

of impure bitartrate of potash contained in crude argol or crude tartar. After having distilled off the ammonia or volatile ammoniacal salts, the tartrate of lime, or tartrate of baryta, or tartrate of strontia formed, is to be separated, and the solution containing tartrate of potash may be decomposed with nitrate of soda, as hereafter mentioned, or may be decomposed with either sulphate of lime, or chloride of calcium, or nitrate of lime, or chloride of barium, or nitrate of baryta, or nitrate of strontia, as to be after mentioned. The decomposition is to be effected in the same manner as tartrate of potash is now decomposed in the manufacture of tartaric acid by sulphate of lime and chloride of calcium. The tartrate of lime, or tartrate of baryta, or tartrate of strontia thus obtained, is separated from the salts of potash produced, and may be decomposed with sulphuric acid, as is now done in the manufacture of tartaric acid from tartrate of lime, and the solution, containing the potash salts, either sulphate or nitrate of potash, or chloride of potassium, be evaporated and crystallized. The apparatus and vessels now employed in manufacturing citric or tartaric acids, or in manufacturing sulphate of ammonia and ammonia, also employed in saltpetre refineries, are applicable to the processes described.

Dr. Price's further improvements in the manufacture of tartaric acid consists in combining bitartrate of potash existing in crude argols, crude tartar, and impure bitartrate of potash, with potash or soda, and in decomposing the tartrate of potash and tartrate of potash and soda with salts of lime, baryta, or strontia.

Having placed impure bitartrate of potash in a suitable vessel, it is first neutralized with a solution of sulphide of potassium or sulphides of potassium, and after separating the insoluble impurities, the solution is placed in a convenient vessel and decomposed with either sulphate of lime or chloride of calcium, or chloride of barium, or nitrate of baryta, or nitrate of lime, or nitrate of strontia, in a similar manner and in similar apparatus to that in which tartrate of potash is now decomposed with sulphate of lime or chloride of calcium. With the exception of sulphate of lime, the baryta, strontia, and lime salts may be added in solution or otherwise in about the following proportions, by weight, viz., 208 parts of chloride of barium, or 160 parts of chloride of strontium, or 112 parts of chloride of calcium, or 166 parts of nitrate of

lime, or 212 parts of nitrate of strontia, or 260 parts of nitrate of baryta, or 172 parts of sulphate of lime, to every 188 parts by weight of bitartrate of potash previously existing in the crude argol, crude tartar, or impure bitartrate of potash, and now existing as tartrate of potash in solution. The solution of the salts of potash thus obtained, being separated by decantation from the tartrate of lime and tartrate of baryta, may be evaporated and crystallized. The impure salts of potash may be purified by re-crystallization, and the tartrate of lime, or tartrate of baryta, or tartrate of strontia, after having been washed with water, may be decomposed with sulphuric acid in the same manner as tartrate of lime is now decomposed, and tartaric acid be herefrom obtained by crystallization. Impure bitartrate of potash, crude argol, or crude tartar, is to be neutralized by means of sulphides of sodium, as after mentioned, and tartrate of potash and soda thereby obtained, which said solution, after being separated from the insoluble impurities, may be evaporated and crystallized. Having obtained a solution of tartrate of potash and soda, by dissolving the said salt in water, the said solution is to be decomposed by means of chloride of calcium, in the proportion of 112 parts by weight of chloride of calcium to every 300 parts by weight of tartrate of potash and soda employed. The decomposition of the mixed solutions may be effected, by treating the same contained in a suitable vessel, the resulting tartrate of lime being allowed to settle. The supernatant solution containing chloride of sodium and chloride of potassium is to be withdrawn, and by evaporation and crystallization chloride of potassium and chloride of sodium obtained. Or a solution of tartrate of potash and soda may be decomposed in a similar manner, by heating the same with sulphate of lime, in the proportion of 172 parts by weight to every 300 parts by weight of tartrate of soda and potash employed. After separating the tartrate of lime formed, the solution containing sulphate of potash and sulphate of soda is to be evaporated, and these salts either obtained together, or they may be separated by re-crystallization. In order to separate certain soluble impurities, such as coloring matters, existing in the solutions of citrates or tartrates of ammonia, potash, or soda, their solutions may be filtered through filters or cisterns containing animal charcoal, or animal charcoal



may be mixed with their solutions, and be separated together with certain impurities by filtration.

As bitartrate of potash of commerce usually contains a certain amount of tartrate of lime, the said tartrate of lime will remain with the impurities after the before mentioned treatment of the said bitartrate of potash, and in order to utilize the same, the residuum is to be treated with sulphuric acid in the same manner, but in proportion to the amount of tartrate of lime present, as the tartrate of lime, mixed with impurities from impure bitartrate of potash, argols or tartars, is now decomposed, and the tartaric acid therefrom obtained.

Mr. Firmin's combined processes of obtaining tartrate of lime for the manufacture of tartaric acid, purified cream of tartar, and binoxalate of potash, are practically carried out in the following way:—Into a vessel such as is used in the manufacture of tartaric acid, a quantity of impure bitartrate of potash (argol or tartar) and water is placed, together with as much carbonate of lime as will suffice to neutralize the excess of acid existing in the bitartrate. By this means neutral tartrate of potash is formed, which remains in solution, and tartrate of lime, which precipitates to the bottom of the vessel. The solution of tartrate of potash is decanted from the tartrate of lime, digested on animal charcoal, and filtered. To such a quantity of this filtered colorless solution, as is found by analysis to contain 100 parts of tartrate of potash, 60 parts of crystallized oxalic acid (dissolved in water), or as much as will serve to decompose one half of the tartrate of potash contained in the solution, are then added. By this means, a neutral solution of oxalate of potash is formed, remaining in solution, whilst the tartaric acid liberated unites with the other half of the tartrate of potash, forming pure bitartrate of potash, which precipitates to the bottom of the vessel.

In the ordinary process of manufacturing tartaric acid, in which a solution of tartrate of potash is decomposed by means of sulphate of lime, a quantity of solution of sulphate of potash is obtained. Mr. Firmin applies this solution of sulphate of potash, when purified and filtered, to the manufacture of binoxalate of potash, by adding to as much of this solution at 180° F. as is found by analysis to contain 100 parts of sulphate of potash, a solution of 100 parts of crystallized oxalic acid, or a sufficient



quantity to effect the decomposition of the sulphate of potash. The solution thus obtained yields crystals of binoxalate of potash on evaporation. The residuary mother-liquor is dilute sulphuric acid.

In these cases the advantage sought to be obtained is, the use of a salt in the manufacture of binoxalate of potash, yielding that alkali at a more economical rate than carbonate of potash, (pearlash), which has hitherto been employed for this purpose. "Suppose, for instance," says Mr. Firmin, "100 lbs. of cream of tartar to contain 25 lbs. of potash, this I do not value at more than 2s., after deducting the loss of quantity owing to the difficult solubility of the sulphate (into which it is converted), and the cost of evaporation, which, owing to the same cause, is very great, while it would require 50 lbs. of pearlash, at a cost of 12s. 6d., to produce the same quantity, independently of the gain upon the purification of the cream of tartar precipitated. Or 100 lbs. of sulphate of potash, of 80 per cent., at 8s. per cwt., will yield, independently of sulphuric acid, 44 lbs. of potash, against 88 lbs. of pearlash, costing 22s."

Dr. Price's improvements in obtaining and refining bitartrate of potash consist in rendering the bitartrate of potash, contained in crude argol and crude tartar, more soluble, by combining the said bitartrate of potash with potash, soda, or ammonia, and obtaining soluble double and neutral tartrates (tartrate of potash and soda, tartrate of potash and ammonia, or tartrate of potash) which said tartrates, being separated from the insoluble impurities contained in the said impure bitartrate of potash, are decomposed by means of acids or acid salts, as after mentioned, and purified bitartrate of potash is obtained more economically and expeditiously than by the methods now generally employed. To effect this the following process is adopted:—Crude argol, or crude tartar, or impure bitartrate of potash, is placed in a closed vessel, with one or more exit pipes, capable of allowing any gas that may be generated to escape, or to be conducted away, and into such vessel is run a solution of sulphide or sulphides of sodium, sufficient to neutralize the bitartrate of potash. The vessel is so arranged, that artificial heat may be applied by steam or otherwise, or that a jet of steam may be admitted: the bitartrate of potash decomposes the sulphide or sulphides of sodium, forming

a tartrate of potash and soda, and sulphuretted hydrogen is liberated, which escapes by the exit tubes. The resulting solution of tartrate of potash and soda, being separated either by decantation or filtration from the insoluble impurities contained in the crude argol, crude tartar or impure bitartrate of potash, is concentrated in a suitable evaporating vessel to about sp. gr. 1.425 at 212° F., and allowed to cool to 60° F.; the crystals obtained are separated from the mother-liquors, and these liquors are again concentrated to sp. gr. 1.425 at 212° F. and allowed to crystallize; the mother-liquors left after this crystallization, if they contain much foreign matter, may be boiled with animal charcoal, filtered, evaporated, and set aside to crystallize. The remaining mother-liquors may be similarly treated, or mixed with liquors resulting from subsequent operations. The crystals of tartrate of potash and soda thus obtained, if they be not sufficiently pure, are to be dissolved in water and re-crystallized. Having obtained tartrate of potash and soda of the desired purity, the crystals are dissolved either in hot or cold water, and a saturated or partially saturated solution obtained; into this solution sulphurous acid is to be passed, which unites with the soda, forming soluble sulphite and sulphites of soda, and bitartrate of potash is precipitated. Sulphurous acid is to be added until the double tartrate of potash and soda is decomposed (which may be known when no further precipitation of bitartrate of potash occurs on the addition of a small quantity of an acid stronger than tartaric to a portion of the solution); the deposited bitartrate of potash is allowed to settle, and the solution is drawn off, and entirely or partially re-saturated with tartrate of potash and soda. Sulphurous acid is again passed into the solution, and the former operations repeated, the supernatant solution may then be separated, and will contain sulphites of soda and bitartrate of potash. The solution may be neutralized with sulphide of sodium or carbonate of soda and concentrated, when tartrate of potash and soda, sulphite of soda, and (if sulphide of sodium has been employed) hyposulphite of soda, will crystallize out. These salts may be separated by crystallization, and the tartrate of potash and soda may be decomposed with sulphurous acid as before mentioned. The bitartrate of potash, thus obtained, is to be washed with cold water, until the whole of the sulphites of soda are removed, and then dried, when it will be ready for use.

The resulting sulphite or sulphites of soda and hyposulphite of soda, which are obtained in this operation, may be dried and fused with small coal or charcoal, and converted into sulphide of sodium. Or the sulphite or sulphites of soda and the hyposulphite of soda may be decomposed in a suitable vessel by sulphuric acid, and the sulphurous acid liberated be collected and employed for precipitating bitartrate of potash from tartrate of potash and soda.

A solution of tartrate of potash and soda, obtained as before described, by neutralizing bitartrate of potash with sulphide of sodium, or from any other source, may be decomposed with bisulphate of potash or bisulphate of soda, or acid sulphates of potash, or acid sulphates of soda, added in the proportion of 300 parts by weight of tartrate of potash and soda (in crystals) dissolved in water, to every 40 parts by weight of sulphuric acid not in combination as neutral sulphate of potash or soda; that is to say—in employing bisulphate of potash, 300 parts by weight of tartrate of potash and soda are to be used for every 137 parts by weight of bisulphate of potash, and 300 parts by weight of tartrate of potash and soda are to be employed for every 121 parts by weight of bisulphate of soda (solid.)

Having dissolved, in any suitable vessel, the acid sulphates of soda, a solution of the tartrate of potash and soda, obtained as before mentioned, is to be added, and after being well agitated, the precipitated bitartrate of potash is allowed to settle. The supernatant solution is then to be separated, and saturated either with sulphide of sodium or carbonate of soda, and evaporated, in order that the sulphate of soda may be separated by crystallization from the tartrate of soda and potash existing in the said solution. The tartrate of potash and soda thus obtained from the supernatant liquor, is to be decomposed with a solution containing an equivalent proportion of acid sulphate of soda, and the deposited bitartrate of potash separated.

If acid sulphate of potash be employed to decompose the tartrate of potash and soda, the supernatant solution, having been separated from the precipitated bitartrate of potash, and having been neutralized with sulphide of sodium, or sulphide of potassium, or carbonate of soda, or carbonate of potash, is to be evaporated, and the sulphate of potash and sulphate of soda separated from the tartrate of potash and soda by crystallization. The tartrate

of potash and soda may be decomposed in a similar manner by means of acid sulphates of soda, and after separating the deposited bitartrate of potash, the supernatant solution may be neutralized with sulphides of sodium or carbonate of soda, and by crystallizing the resulting sulphite of soda and hyposulphite of soda, obtained by evaporation and crystallization, they may be decomposed by adding an equivalent of sulphuric acid to a solution, or to crystals of sulphite of soda or hyposulphite of soda contained in a suitable vessel, and the free sulphurous acid liberated, collected and employed for decomposing tartrate of potash and soda as before mentioned.

Dr. Price's further improvements in the manufacture of bitartrate of potash, relate to the decomposition of tartrate of ammonia and potash by means of acids and acid salts, so as to obtain purified bitartrate of potash, which is effected as follows: Having obtained a solution of tartrate of potash and ammonia in the manner before described, and the said tartrate of potash and ammonia having been placed in a suitable vessel, sulphurous acid is passed into the same, until no further precipitation of bitartrate of potash is occasioned on the addition to the solution of a small quantity of an acid stronger than tartaric acid. The deposited bitartrate of potash being separated, the solution, containing sulphite of ammonia and bitartrate of potash may be decomposed in a suitable vessel, by means of sulphuric or hydrochloric acid, so as to obtain sulphurous acid, which may be employed for effecting the decomposition of a subsequent quantity of a solution of tartrate of potash and ammonia. The resulting sulphate of ammonia or chloride of ammonium, containing in solution a certain amount of bitartrate of potash, is to be neutralized with any of the before mentioned volatile alkaline ammoniacal salts, and evaporated; and the sulphate of ammonia or chloride of ammonium obtained by crystallization. The mother-liquors containing tartrate of potash and ammonium are to be acidified with sulphurous acid, in order to obtain bitartrate of potash. The resulting solution is then neutralized with ammonia, and evaporated as before mentioned, care being taken, in both instances, that the solution be kept slightly alkaline by means of ammonia or alkaline ammoniacal salts during and after concentration.

The tartrate of potash and ammonia may be decomposed, and

purified bitartrate of potash obtained, by decomposing the said tartrate of potash and ammonia with bisulphate of potash or bisulphate of soda, or acid sulphate of potash or soda in the same manner, and in the same proportions, as described under the process for decomposing tartrate of potash and soda with acid sulphate of soda and acid sulphate of potash, for every 188 parts by weight of bitartrate of potash originally contained in the impure bitartrate of potash. If bisulphate of potash is employed, bitartrate of potash is precipitated, and sulphate of potash and sulphate of ammonia remain in solution with a certain amount of bitartrate of potash. The solution is kept neutral or alkaline by the addition of ammonia or the volatile salts thereof as before mentioned, and when evaporated to a sp. gr. of about 1.350 at 212° F. a solution of bisulphate of potash or sulphuric acid may be added, in sufficient quantity to neutralize the ammonia existing in excess, and also that which is combined as tartrate of potash and ammonia. The resulting bitartrate of potash which precipitates is separated, and the solution neutralized with ammonia, or potash, or their carbonates, or sulphides of the same, and evaporated, in order to obtain by crystallization the sulphate of potash and sulphate of ammonia. The tartrate of potash and ammonia existing in the mother-liquors may be decomposed as before mentioned.

Or, sulphuric or hydrochloric acid may be employed to decompose the tartrate of potash and ammonia obtained by neutralizing impure bitartrate of potash by means of gas-liquor, ammonia, carbonate of ammonia or sulphides of ammonia, obtained by decomposing citrates on tartrates of ammonia, by means of hydrated caustic lime, carbonate of lime, or sulphides of calcium, sulphides of barium or sulphides of strontium, in the proportion of 50 parts of monohydrated sulphuric acid, and 37 parts of actual hydrochloric acid contained in any dilute acid solution, to every 188 parts of bitartrate of potash existing in the crude argol or crude tartar, and now existing in solution as tartrate of potash and ammonia; after separating the precipitated bitartrate of potash, the resulting solution, containing the sulphate or muriate of ammonia, may be separated by crystallization. The tartrate of potash and ammonia remaining in the solution, is to be decomposed with an equivalent proportion of either sulphuric or hydrochloric acid.

Tartrate of potash having been obtained, either by neutralizing bitartrate of potash with sulphide of potassium, or neutralizing bitartrate of potash with carbonate of lime or lime, the solution of tartrate of potash having been placed in any suitable vessel, sulphurous acid is passed into it, until no further precipitation is effected, by the addition of a small quantity of an acid stronger than tartaric acid to the solution. The precipitated bitartrate of potash is separated, and washed with cold water. The decanted or filtered solution is neutralized with sulphide of potassium, and concentrated to about sp. gr. 2.000 at 212 F., the tartrate of potash existing in solution is decomposed by sulphurous acid, the resulting bitartrate of potash is separated as before-mentioned, and the mother-liquors, being separated from the precipitated bitartrate of potash, after having been neutralized with sulphide or sulphides of potassium, are concentrated, and the sulphite and hyposulphite of potash are separated from the tartrate of potash by crystallization, or the sulphite and hyposulphite of potash thus obtained may be re-converted into sulphide of potassium, by heating the dried salts with small coal, in a reverberatory or suitable furnace, and the sulphide of potassium resulting, may again be employed for neutralizing and dissolving impure bitartrate of potash, or the sulphides or hyposulphite of potash may be decomposed with a stronger acid, and the liberated sulphurous acid be employed for a subsequent operation.

Another improvement of Dr. Price's in the manufacture of purified bitartrate of potash consists in that tartrate of potash and soda (obtained by neutralizing impure bitartrate of potash by sulphide of sodium, or obtained by decomposing tartrate of potash and ammonia, or tartrate of potash by means of nitrate of soda or sulphate of soda, or chloride of sodium, so as to obtain nitrate of potash or sulphate of potash, or chloride of potassium and tartrate of potash and soda before described) is to be decomposed by sulphuric acid or hydrochloric acid, in the proportion by weight of 50 parts of monohydrated sulphuric acid contained in solution in water, or 37 parts by weight of actual hydrochloric acid contained in solution in water, to every 300 parts by weight of tartrate of potash and soda employed. Tartrate of soda and potash obtained as above mentioned, being dissolved in either warm or cold water, and placed in a convenient vessel, sulphuric



or hydrochloric acid is added in the proportions above mentioned. The bitartrate of potash, which is precipitated, is allowed to settle, and the supernatant solution is decanted or filtered from the deposited bitartrate of potash. The solution separated is neutralized with sulphide or sulphides of sodium, and concentrated by evaporation, when sulphuric or hydrochloric acids are to be added to decompose the tartrate of potash and soda existing in the concentrated solution, and they are to be added until no further precipitate of bitartrate of potash is occasioned by the addition of the same to the said solution. The said solution, being separated from the precipitated bitartrate of potash, and neutralized by means of sulphides of sodium as before mentioned, is to be evaporated, in order that the salts of soda (sulphate of soda or chloride of sodium) may be separated by means of crystallization. The mother-liquor remaining will contain a small quantity of tartrate of potash and soda, which may be decomposed by means of sulphuric or hydrochloric acid as before mentioned, or may be mixed with mother-liquors resulting from a subsequent operation.

Mr. Gatty's process for obtaining tartrate of lime to be used for the manufacture of tartaric acid, conjointly with carbonate of soda or potash, consists in decomposing solutions of the neutral tartrate of potash and neutral tartrate of soda by means of carbonic acid gas or carbonate of lime, and is performed in the following manner:—Into a cylindrical wooden vessel, of the capacity of about 400 gallons, 300 gallons of solution of neutral tartrate of potash, marking 5° of Twaddell's hydrometer, are introduced through an opening in the top of the vessel. 34 gallons of milk of lime, each gallon containing one pound of lime, are then added, and the opening closed by means of an air-tight cover. Carbonate of lime, or a mixture of carbonate of lime and lime, may be employed instead of lime only. An agitator, passing through an air and steam-tight stuffing box in the top of the vessel, is then set in motion, and a current of carbonic acid gas passed into the mixture until its complete saturation is effected. The result is, that bicarbonate of potash and tartrate of lime are formed, the former of which remains in solution, whilst the latter is precipitated to the bottom of the vessel. The clear solution of bicarbonate of potash is now run off, and the tartrate of



lime well washed, to remove all the potash salt ; the first washings being mixed with the stronger solution, and the latter reserved to be used for the first washing waters of another operation. The tartrate of lime thus produced may be employed in the manufacture of tartaric acid. The solutions of bicarbonate of potash are next evaporated to dryness in an iron pan, by which means the bicarbonate is changed into sub-carbonate, which may be calcined in a reverberatory furnace, when a carbonate of potash will be produced, sufficiently pure for most manufacturing purposes. If required of greater purity, it may be purified in the usual manner. The carbonic acid gas may be produced in any known manner. The same process is applicable to the manufacture of soda, substituting neutral tartrate of soda for the neutral tartrate of potash above-mentioned.—*London Pharmaceutical Journal*, Jan. 1854.

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#### ON THE USE OF BENZOLE IN THE PREPARATION OF VEGETABLE ALKALOIDS.\*

BY JOHN WILLIAMS.

The application of Benzole to the elimination of various vegetable alkaloids having engaged my attention for some time past, I venture to lay the present paper before you, more in the hope of its receiving practical adaptation from your hands, than from any idea that the subject has been worked out to its fullest extent.

First, then, a few words respecting benzole :

This important and interesting body was first discovered by Faraday, and named by him *bicarburetted hydrogen* ; it was afterwards produced by decomposition of benzoic acid by heat in presence of lime or baryta, and hence named benzole ; it has, however, since been proved to exist in very considerable quantities in coal-tar naphtha, or that portion of the liquid products of the destructive distillation of coal, which floats on water, boils below the temperature of 212° F., and congeals to a solid mass at 32°. The ordinary coal-tar naphtha of commerce is a very impure product ; the mode of separating the benzole from

\* Read before the "Chemical Discussion Society," Oct. 27th, 1853.

it, was, I believe, first pointed out by Mansfield. He took the ordinary naphtha, distilled it in a still with a double head, so constructed that only that portion of the naphtha which distils at the lowest temperature was collected; the product thus obtained was digested with oil of vitriol, which turned it black. I have found it necessary that this part of the process should be repeated at least twice, or the proper degree of purification would not be effected. The benzole thus separated was now washed with water, dried with anhydrous sulphate of soda, and re-distilled; it was then exposed to a freezing temperature, and, when solid, subjected to pressure, when the pure benzole was obtained; but, for the purposes I have to point out, I do not consider this last operation necessary.

Benzole, thus obtained, is a clear, volatile liquid, having still a distinct odor of coal gas, but more aromatic; it is quite insoluble in water, and is excessively inflammable; this last property renders great caution necessary in conducting the processes I am about to describe. Benzole, in its powers of solution, may be likened to ether, but, from its low price, and from its not being so volatile as that body, it possesses practical advantages in working, which, I think, will more than counterbalance its disagreeable odor and great inflammability.

The first application of benzole I have to describe is in the preparation of quinine and its allied bases. An acid infusion of the bark was prepared in the usual manner; sufficient caustic potassa was added to render it strongly alkaline; it was then shaken with about one-fourth of its bulk of benzole; the whole of the quinine, quinidine, quinoïdine, &c., was at once yielded to that agent. I found, however, that the cinchonine was not extracted without greater difficulty. The benzole was distilled off, leaving the mixed alkaloids as a slightly yellow, resinous mass, which, when dissolved in weak sulphuric acid, and filtered, yielded a solution from which the white bases were at once precipitated, and separated in the usual manner.

This process, I think, would not answer for manufacturing quinine on a large scale, but I find it is a very elegant, certain, and easy mode of performing the analysis of cinchona barks, for, if moderate care is used, the alkaline liquid remaining after

the action of the benzole does not contain the smallest trace of alkaloid.

The next substance acted upon was the quinoïdine or amorphous quinine of commerce, which, as usually found, is a blackish, resinous looking substance, with a peculiar, burnt, empyreumatic odor. When this body is powdered and digested with benzole it yields all its bitter principle to it, the benzole generally separating from the mass almost colorless. By distilling, or dissolving, the residuum in weak sulphuric acid, filtering (which effectually deprives the liquid of any odor of benzole with which it may be contaminated) and precipitating with caustic soda, the quinoïdine or amorphous quinine is obtained of a pale straw color, and when dissolved in weak  $\text{SO}^3$  yields a nearly colorless solution. Of course the quantity yielded is comparatively small—rarely more than a drachm from an ounce—but often not nearly so much, thus rendering the real quinoïdine a more expensive body for medical use than even quinine itself.

I may here mention one great advantage in the use of benzole in preparing these alkaloids, which is, that the coloring matter contained in the liquid, extract, or powder acted on, is almost invariably left behind, so that with one operation the base is obtained pure, or nearly so, and any odor arising from the benzole is lost when the base is dissolved in acid, filtered, and re-precipitated.

Morphine was the next body to which my attention was directed, but in this instance I failed to obtain a satisfactory result; morphine being but slightly, if at all, soluble in benzole, in which particular benzole again agrees with ether.

With the next alkaloid, however, I was more successful. Nuxvomica seeds were taken, softened in boiling water, sliced in a proper machine, and boiled in many successive waters until that menstruum ceased to extract either color or taste from the seeds. It might be advantageous to use weak sulphuric acid in this operation; but, for reasons which it is not necessary to mention, this was not done. The liquids were now boiled down in a copper to a convenient bulk, filtered, and again evaporated to the consistence of thin treacle. To this aqueous extract a strong solution of caustic potassa was added until it was strongly alkaline. It was then mixed with an equal bulk of benzole, well agitated,

and kept in a warm stove for about twelve hours. The first benzole was poured off, and a second, but a smaller quantity, was added, and left to digest in like manner with the extract, and afterwards the mixed benzoles distilled—the residuum, treated with acetic acid, filtered, and precipitated with caustic soda; the precipitate was white, and consisted of strychnia and brucine. These were dissolved in sulphuric acid and separated in the usual manner. The quantity of strychnine yielded by this process is large; and, when it is dissolved in a little weak alcohol and allowed to crystallize, the base is yielded of great beauty and perfect purity.

The next process I have to describe is one for preparing cantharidine. This substance, though of great use to the medical man, has hitherto, from the great expense of manufacturing it, been comparatively little used in its pure form. Powdered cantharides are to be heated to about  $150^{\circ}$ , with rather more than an equal bulk of benzole; after about an hour's digestion the magma is to be transferred to a percolator; and, when the first portion of benzole has gone through, fresh warm benzole is passed through it. A pound of cantharides requires about from six pints to a gallon of benzole to be thoroughly exhausted. The benzole is now to be distilled. A rather dark colored oily liquid is the result, which is to be poured into an evaporating-basin, and left for, say twelve hours; at the end of which time the liquid will be found studded with magnificent crystals of cantharidine sometimes a quarter of an inch long.

I found some difficulty in purifying these crystals from the mother-liquid, but at length succeeded by washing the whole mass in a beaker-glass with a little cold ether, which dissolved the dark oily liquid freely, but scarcely affected the cantharidine; the crystals subsided to the bottom, and the supernatant liquid being poured off, the crystals were washed once or twice more with very small quantities of ether, and then turned out on bibulous paper; they speedily dried but were not quite white; by dissolving them in a flask of fresh benzole, heating, adding a little charcoal, filtering, and allowing the liquid to cool, they were obtained of perfect whiteness, but not so large as at first. From a pound of cantharides about thirty grains of cantharidine may thus be readily obtained.

I must caution those that follow this process to beware of the blistering property of the benzole solution of cantharidine in all its stages. Unless great care be used severe blisters will be the painful result.

The following applications of benzole have not yielded quite such satisfactory results as the foregoing, but still such as to encourage us to persevere in the application of this body to delicate chemical manipulation, and to prove that it is an important addition to our means of organic research.

Atropine was obtained, though not in distinct crystals, by the following method. An aqueous extract of belladonna, prepared with great care, *in vacuo*, was rubbed with sufficient water to soften it; then a little very concentrated solution of carbonate of potassa having been incorporated, the benzole was added, and the whole well rubbed together. After two or three quantities of benzole had thus been rubbed with the extract they were mixed and distilled; the dark oily residuum was treated with acetic acid, filtered, and precipitated with ammonia, a white curdy precipitate was formed; which, however, was not yet pure, as it refused to crystallize when dissolved in alcohol and evaporated: a resinous or oily matter still contaminated it, which interfered with its purification. This subject still engages my attention, and I hope at a future opportunity to be able to give a better account of the matter.

Extract of henbane, prepared with equal care, was treated in a similar manner; the acid solution of the oily residuum did not, however, give a curdy precipitate with ammonia, but only a slight opalescence; however, upon shaking the liquid with an equal bulk of ether, separating and allowing the ether to evaporate very slowly, a minute quantity of crystals were on one occasion produced, which burnt perfectly, were soluble in a few drops of dilute acetic acid, and precipitated again as a white cloud by ammonia, which cloud was instantly taken up by being shaken with ether.

I next turned my attention to the so-called sulphate of bebeerine of commerce. It was treated with a solution of caustic potassa, and then with benzole; the benzole being distilled off yielded the bebeerine of a pale straw color, but in very small quantity. It was soluble in acids and precipitated by alkalies,

and possessed the usual basic characters. I did not attempt to crystallize it.

Extract of digitalis was tried, and readily yielded its alkaloid.

Extract of conium also, the benzole being washed with weak sulphuric acid, yielded the sulphate of conium, which, afterwards distilled with strong potassa, yielded the coneine in a state of purity.

Taraxacum, sarsaparilla, and colocynth, were tried, but no active principles could be eliminated from these bodies by this process.

Nut galls, in fine powder, were treated with benzole. Tannin, of good color, was the result of its evaporation; but from the impossibility of perfectly freeing it from the odor of the benzole, I fear that this process will not prove of practical use, unless in the production of tannin on the large scale for use in the arts, when the odor would be of minor importance.

I hope to be able on a future occasion to give you a few more illustrations on the practical use of benzole in operative chemistry.—*N. Y. Jour. of Pharm. from Chemist*, December, 1853.

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#### ON THE PREPARATION OF COPAL VARNISH.

BY PROF. HEEREN.

There is no difficulty in dissolving copal in fatty and volatile oils when the resin has been previously fused; by this process, however, a more or less distinct coloration is produced, and the natural hardness of this fine resin is injured. It has therefore been often attempted to dissolve copal without previous fusion; but, as is well known to all who have occupied themselves with this question, great difficulties have been found in effecting the solution. Directions have been given to soak the pounded copal in ether or ammonia until it swells up into gelatinous form, and then to dissolve it in strong alcohol; but this process never succeeded with the author, though he tried it repeatedly. Others recommend hanging the copal in a small bag in a retort, in which absolute alcohol is gently boiling. This method also failed, in the author's hands, in producing even a tolerably-concentrated varnish.

The best prescription appears to the author to be that given

by Freudenvoll in his treatise on the preparation of varnishes. According to him, 4 oz. of West Indian copal are dissolved in a mixture of

4 oz. oil of turpentine, and  
6 oz. alcohol of spec. grav. 0.813;

or a mixture of

4 oz. sulphuric ether,  
4 oz. oil of turpentine, and  
4 oz. alcohol of spec. grav. 0.851.

When engaged in testing this process, which gave very good results, the author found a small variation, which he describes as follows, particularly efficacious:—

Two sorts of copal occur in commerce, the East and West Indian. The former is usually in small, irregular, rounded pieces, with a finely verrucose surface, the resemblance of which to the skin of a goose has obtained for it the name of “goose copal.” It is of a somewhat yellow color, and is preferred for the manufacture of oily copal varnish, because it acquires less color by fusion than the West Indian. The latter does not possess a warty surface; it is very pale in color, often nearly colorless, and occurs in large irregular fragments, partly with a rounded surface and partly with a shelly fracture.

West Indian copal can only be employed in the following solution, the East Indian forming only gelatinous lumps, but never a solution. The solvent is a mixture of

60 parts by weight of alcohol of spec. grav. 0.813,  
10 parts by weight of sulphuric ether,  
40 parts by weight of oil of turpentine,

in which 60 parts of copal are to be dissolved for the production of a varnish of an oleaginous consistence. Solution takes place even in the cold, without any previous gelatinous swelling of the copal; but it is effected much more rapidly with the assistance of a gentle heat. As, however, single pieces are often found in the West Indian copal, which, instead of dissolving, only swell up in the fluid, by which the rest of the solution is spoiled, it is advisable to select only the large and perfectly clear pieces for the purpose of varnish making, and to test each first of all as to its solubility. This little trouble is richly repaid by the certainty of the result.



To test this quality, a small splinter of the copal is put into a small test tube; a little of the solvent fluid is then poured in, and the whole is heated. If the copal dissolves completely in a few minutes without becoming gelatinous, it is good.

When the desired quantity of good copal has been got together in this manner, it is to be pounded to a tolerably fine powder, which is to be put into a glass retort or flask, the necessary quantity of the solvent added, and the whole heated and shaken until solution is effected. To clear the varnish, which may appear somewhat dull, from dust or other impurities, it may be allowed to stand a long while until these settle; or if it be desired to effect this quickly, it may be filtered through blotting paper, placed as a filter in a glass funnel; the filter must not project above the edge of the funnel, so that the latter may be closed by a glass plate laid over it. The passage of the thick varnish is of course very slow, but the varnish is obtained perfectly clear in this manner; and if the copal employed were very clear, it is nearly colorless. It dries rapidly, but like all turpentine varnishes, retains a slightly sticky surface for some days.—*Chem. Gaz., May 1, 1854, from Dingler's Polytech. Journ.*

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#### THE ESSENTIAL OIL OF BITTER ALMONDS.

BY DR. DOUGLASS MACLAGAN.

He commenced by observing, that attention had been directed in Edinburgh to this subject by the recent occurrence of a case of accidental poisoning, with a bottle of a flavoring substance marked quintessence of ratafia, and which was, in reality, oil of bitter almonds. Dr. George Wilson, who examined the poison in this case, had brought under the notice of the authorities the well-known fact that by chemical means the hydrocyanic acid might be separated from the hydruret of benzule, which forms the real flavoring ingredient, and that thus the great source of its poisonous properties might be removed. It was still matter of doubt, however, whether even after complete removal of the hydrocyanic acid, the hydruret of benzule was or was not poisonous, and Dr. MacLagan had made a series of experiments to satisfy himself on this point. The author first reviewed the processes for separating the prussic acid from the oil. Agitation

of the oil with abundance of milk of lime and caustic potash, and subsequent distillation, appeared to be quite effectual; but as the addition of a salt of iron does no harm, and does not add materially to the expense, and as this method has succeeded well with him, he was disposed to prefer it. The essential point seemed to be that the agents employed, should, by careful and sufficiently prolonged agitation, be brought into perfect contact with the oil. Dr. Maclagan said that it had been suggested that perhaps one distillation might be saved by adding the lime and potash to the marc of the almonds when the oil was first distilled. This appeared to him *à priori* to be unlikely, from the facility with which both the amygdalin and the emulsin of the bitter almond were acted on by alkalis, and accordingly he had found on actual trial, that under these circumstances, no oil was separated, but only an ammoniacal liquor distilled over.

Dr. Maclagan insisted on the absolute necessity, whatever process of purification was followed, of carefully testing the product for hydrocyanic acid. This was best done by agitating the oil briskly with aqua potassæ, passing through a wetted filter, and applying the iron test in the usual way to the filtrate. It was to the neglect of sufficient agitation with aqua potassæ that he ascribed the fact, that in oil in which no hydrocyanic acid had been detected, it had sometimes on subsequent trials been readily found. It had been suggested that possibly the hydrocyanic acid might not really exist in newly rectified oil, but might be re-developed in process of time. Dr. Maclagan showed that this was not the case, by a specimen of the rectified oil, but prepared by himself twelve months ago, still being quite free from all trace of hydrocyanic acid, and moreover, not giving, under Lassaigne's potassium test, any trace of nitrogen, without which, of course, hydrocyanic acid could not be re-developed.

In relation to the more immediate question, whether or not the pure hydruret of benzule was poisonous, the author recapitulated the views and contradictory statements that had been made on the subject, and noticed the statement made in the posthumous volume of Dr. Pereira's *Materia Medica*, on the authority of Mitscherlich, that the pure oil was a poison. He then recounted his own experiments on animals, giving the preference for this purpose to dogs over rabbits, as being more fitted to test

the probable effects of a poison on the human subject. He had experimented with both these kinds of animals. The experiments on dogs were five in number. These animals got respectively twenty-five minims,  $\text{ʒi}$ ,  $\text{ʒij}$ , and two of them  $\text{ʒiij}$  of the oil, and in no instance did death or urgent symptoms of any kind occur. Slight vomiting was produced by the  $\text{ʒij}$  and  $\text{ʒiij}$  doses; but the escape of the animals could not be ascribed to this, because in one after a  $\text{ʒiij}$  dose, vomiting did not occur for twenty-five minutes; and in another after a similar quantity, the animal, within two minutes of its vomiting, passed urine, smelling strongly of the oil, which showed that it had been absorbed in the circulation. It was remarkable, that in some of these experiments, in which the animals were in no way seriously affected, the sample of oil furnished to him actually did retain some hydrocyanic acid, as shown by the iron test. It was satisfactory to find that this test could thus detect quantities of a hydrocyanic acid too small to produce poisonous effects.

Dr. MacLagan then related his series of experiments on rabbits:—

$\text{ʒj}$ . of the oil not entirely free from hydrocyanic acid produced no effect worthy of note for four hours, during which the animal was under observation. The rabbit was found in apparently perfect health next morning, and fed as usual, but died after thirty-nine hours. It was found to have inflammation of both lungs.

$\text{ʒij}$ . of the same oil were given to another rabbit; the animal fell on its sides in eight minutes, with complete relaxation of all the muscles, and died in sixteen minutes, without further approach to convulsions than some twitching of the muscles of the head and neck.

$\text{ʒij}$ . of another sample of oil, perfectly free from hydrocyanic acid, caused the animal to fall on its side in ten minutes, and it was moribund in nineteen minutes. Dr. MacLagan being desirous of trying the effect of cold affusion, practised it on this rabbit. It had the effect of temporarily making the breathing slower and more regular; but the animal died fifty minutes after taking the oil.

$\text{ʒij}$ . of another sample of oil prepared by himself, and perfectly free from prussic acid, were given to a strong buck rabbit.

No effect was produced for twenty minutes; it looked a little dull, but revived shortly, and remained quite well for four hours and a half, during which it was under examination, but it died in the course of the night.

With the urine of these rabbits Dr. MacLagan was enabled to confirm the observation of Wöhler and Frerichs, that the oil in its passage through the system was converted into hippuric acid, and if administered in a large quantity, partly passed unchanged into the urine.

To contrast the action of the oil on rabbits with that of other volatile oils, the author made some further experiments. ʒij. of oil of carraway on a dog produced no other effect than slight vomiting. ʒj. of oil of cloves on a rabbit the animal fell motionless on its side in fifteen minutes, and died in an hour and a quarter. The symptoms were essentially the same as those produced by the rectified oil of bitter almonds, though the fatal result was not so speedy.

Dr. MacLagan summed up the evidence afforded by the experiments of others by stating the following conclusions to which he had been led.

1. That the marked difference between rectified and unrectified oil shows that the poisonous action of the latter is essentially due to the hydrocyanic acid which it contains.

2. That the oil really free from hydrocyanic acid, in doses of a few drops, does not act as a poison on animals generally; and that the instances of fatal effect on man and animals from such doses of unrectified oil must be referred entirely to the hydrocyanic acid.

3. That experiments on rabbits with quantities of half-a-drachm and under, invariably show that if quite free from prussic acid, such doses do not cause fatal effects. But in larger doses [a drachm and upwards] it does, even when quite free from hydrocyanic acid, prove fatal to rabbits, but with great variation in respect to the rapidity of the death, which variation is due to the physiological peculiarities of these animals.

4. That in dogs, whose organization renders them much better subjects for testing the probable effects of the substance on man, dose seven so large as three drachms of the oil, nearly or entirely free from prussic acid, produce no other affect than a little vomiting, and do not cause death or even dangerous symptoms.

5. That experiment shows that if this substance is to be called a poison at all, it must be regarded as one of no great activity ; but that in reality it cannot, even on the ground of its effects on rabbits, be styled a poison, without including under that denomination many substances, such as oil of cloves, which cannot be regarded as poison in the common sense acceptation of the term.

6. That the use of the purified oil to make flavoring condiments, is open to no objection which would not apply to ordinary aromatic volatile oils, and that the spirituous solutions sold for this purpose, if made of properly purified oil, are not dangerous.

7. That since by due care the oil can be so freed from hydrocyanic acid as to deprive it of active poisonous properties, great culpability will attach to the sale of preparations made with unrectified oil.—*Trans. North British Branch of Pharm. Society.*

[NOTE.—As the sale of bitter almonds is becoming more and more extensive as a flavoring material, we have deemed it advisable to re-publish the above and the two following papers, for the information of apothecaries and druggists who may desire to take the precaution to free this oil from prussic acid before they vend it for culinary purposes.—*Ed. Am. Jour. Ph.*]

## ON THE PURIFICATION OF ESSENTIAL OIL OF ALMONDS.

By MR. GEORGE WHIPPLE, F.C.S.

The purification of oil of bitter almonds, and the means by which hydrocyanic acid can be most advantageously separated from the crude oil, having recently occupied the attention of Pharmaceutical Chemists, I beg to communicate some of the results of my experience as a drawer of this and other essential oils.

The method recommended by Dr. MacLagan (*Pharmaceutical Journal*, vol. xiii., p. 277) for removing hydrocyanic acid, is not only complex, but fails to render the oil permanently innocuous.—(Vide Pereira's *Materia Medica*, 3rd edit. p. 1776.)

Some years ago I thought of obtaining hydrocyanic acid and essential oil of almonds at one and the same time, by receiving the contents of the condensing worm into a solution of nitrate

of silver, and subsequently decomposing the resulting cyanide of silver with hydrochloric acid. Since the publication of Dr. Mac-lagan's paper I have tried this process, and the oil obtained by it was submitted to Dr. Stenhouse for examination, and pronounced by him to be entirely free from hydrocyanic acid. Whether it be innocuous I leave to be decided by others.

When commercial oil of bitter almonds is mixed with a solution of nitrate of silver, and the mixture allowed to stand for some time, crystals of cyanide and nitrate of silver are abundantly formed.

Thirty-two parts of the crude essential oil, sp. gr. 1.079, were redistilled, and received into a solution of nitrate of silver, when an abundant deposit was formed containing cyanide of silver. The oil was collected, added to a second portion of nitrate of silver in solution, and again distilled, yielding six parts of a colorless oil of sp. gr. 1.051, in which no trace of hydrocyanic acid could be detected. This oil retains the flavoring of the bitter almond.

In distilling the essential oil from almond cake, three oils differing in density are obtained. The mixture of these oils is opaque, but becomes bright on being filtered. These results, however, are not peculiar to the production of almond oil. Sassafras yields two oils, a stéaroptène and an odorless salt, very like common alum in appearance, but perfectly soluble in the oils from which it is deposited. This stéaroptène is deposited like the crystalline matter in oil of almonds, but so far as my experience has gone, the product from sassafras is always the same, which in the case of the almond I have not found to be so. The largest crystalline deposit from oil of bitter almonds that has come under my notice was of the consistence and color of honey. This when washed with alcohol afforded the lemon-colored crystals which were examined by the late Dr. Pereira, and a specimen of which is among the collection of the Pharmaceutical Society. Another remarkable deposit which I obtained from oil of bitter almonds was examined by Dr. Faraday, and said to be either benzoic or amygdalic acid.

Subsequently on using steam for distilling the oil, all the crystalline deposits I have obtained, which have been examined by Dr. Stenhouse and others, have been designated benzoic acid.

After this crystalline deposit has been formed it is sometimes dissolved and again re-deposited, in which respect it differs from what occurs in the case of oil of sassafras. I have never found, if the stéaroptène of sassafras is dissolved in the oil from which it was deposited, that it is deposited again, nor have I been able to crystallize it after it has been liquefied.

We know that benzoic acid is instantly and largely dissolved by essential oil of almonds, and again deposited with change of temperature; and I have placed on the table some of the crystalline deposit thus formed. It will be observed that the appearance of the crystals is different from that of the crystals which are formed spontaneously in oil of bitter almonds. The latter appears to me more nearly to resemble the crystalline product obtained from balsam of tolu, which by Thompson and others has been designated benzoic acid, but which has subsequently been shown to consist principally of cinnamic acid. This cinnamic acid is said to be formed by the oxidation of hyduret of cinnamyle, just as benzoic acid is produced from hyduret of benzoyle. I have observed that during the formation of the crystalline deposit in oil of bitter almonds, water is at the same time produced, which floats upon the oil, a fact which supports the opinion of the crystalline matter being benzoic acid.

Although the crude oil of bitter almonds contains a large but variable quantity of hydrocyanic acid, yet the hyduret of benzoyle is found to be insoluble in hydrocyanic acid, at least in the aqueous acid. Whether it be so in the anhydrous acid, as was hinted by Dr. Stenhouse, is an interesting subject for inquiry.

I may here notice the impropriety of employing the water obtained in the distillation of the essential oil of almonds for culinary purposes. The quantity of hydrocyanic acid contained in this water varies very considerably, and the strength of it is sometimes such as to render it highly dangerous. The solution of the essential oil in spirit, called essence of almonds, as commonly sold, is also, as I conceive, unnecessarily strong. It is usually prepared of the strength of one part of oil and seven of spirit. If made in the proportions of three fluid drachms of oil to sixteen fluid ounces of spirit, it would afford a better flavor, and be much safer.—*Ibid.*



## PURIFICATION OF ESSENCE OF ALMONDS.

By MR. T. B. GROVES.

The case of poisoning by bitter almonds, which occurred some months back in London, has once more directed the attention of Chemists to the means of depriving the oil of its poisonous character.

The pure oil is known to be innocuous, at least as much so as any merely irritating oil can be, and that its poisonous nature is entirely owing to a contamination of prussic acid, which the oil contains in addition to benzoic acid, benzoine, &c. The proportion of prussic acid varies much, some samples containing, as stated by Taylor, twice as much as others, or even more. Turner states it to be 12.6 per cent., others eight or ten, at any rate it may be said to be from four to six times the strength of the acid of the London Pharmacopœia. The oil itself is, I believe, seldom sold without dilution with spirit, except as a scent for pomades, in which case the presence of prussic acid would be of no importance. Instances, however, have occurred, when it has been sold as almond flavoring, although ill adapted for the purpose, and fatal accidents have resulted. The smallest quantity known to have produced fatal effects is stated by Taylor to be seventeen drops; the largest quantity from which the patient recovered thirty minims. The importance, therefore, of purifying it is evident. The usual almond, ratassia or peach kernel flavor, is made by dissolving one part of the oil in seven or nine parts of rectified spirit. I prefer the latter proportion, and the essence is more manageable, and should be mixed in the convenient proportion of one drop of essence to one ounce of liquid to be flavored. In order to purify the oil, and to do away with the danger attendant on its use in the crude state, it is recommended to distil it from a mixture of proto-chloride of iron, lime and water. To these ingredients Mr. Redwood adds peroxide of mercury, and states, that without this the whole of the acid is not removed. The mixture cannot be distilled from a glass retort, on account of the violent burnings that would occur—a copper or other metal still is indispensable for the purpose. On account of the troublesome nature of the operation, the loss sustained, and, above all, the fact that nine chemists out of ten do not possess

a metal still of the proper dimensions, the oil is rarely purified. These considerations acted forcibly on myself, and induced me to attempt the purification of the essence by means within the reach of all; and I think I have succeeded in doing so. The process is not altogether novel, being a modification of the well-known iron-test for prussic acid. I at first mixed with the essence a solution of the proto and perchlorides of iron, which are both soluble in spirit, then a slight excess of liq. potassæ, and finally sufficient dilute sulphuric acid to neutralize that excess. I found this to separate considerable quantity of Prussian blue, but that it did not remove the whole of the prussic, although the proportions of the ingredients were varied very many times. I at last prepared three quantities, in the first of which the acid predominated, the second was neutral, the third strongly alkaline. All three were exposed in small flasks in the laboratory window, and agitated occasionally for two days. In the meantime the first had assumed a bright blue, which had increased from the first, and gave promise of complete purification; the second and third were of an olive-green. As therefore the protoxide was just disappearing, and fearful that oxidation would commence, they were rendered neutral by sulphuric acid, and after a short time filtered. The third was the only one found to be quite free from prussic acid, viz., that in which the alkali had been in excess. From my experiments I deduce the following formula.

Make a solution of protochloride of iron by adding an excess of iron wire to the dilute hydrochloric acid of the Pharmacopœia; when the solution has become neutral, add one drachm of it to an ounce of the essence (containing one-tenth by measure of essential oil,) and then twenty-five grs. of potass (the commercial potassa fusa answers the purpose) dissolved in one drachm of distilled water. Shake them well together, and keep the mixture, shaking and opening the vessel occasionally, until it has acquired an olive-brown color, then neutralize with dilute sulphuric acid, and after a short time filter. About six drachms will come through without attention, and a further quantity by tapping with the finger the funnel containing the filter. Let the filter then be washed with spirit, until the required quantity be obtained. Nearly the whole of the water will be retained on the filter by the *hydrated* oxides and the cyanide.

The cost of the process may therefore be summed as the metallic ingredients and 3iss. of spirit, very trifling, considering the importance of the object. It is very probable that the cost may be still further reduced by diminishing the quantity of iron and potass, but as I have not tried a less quantity, I cannot recommend its adoption. From an ounce of essence thus treated, I obtained, by treating the mass in the filter with hydrochloric acid, ten grains of what appeared to be pure Prussian blue. Considering it is such, and that it does not contain water (although it is stated to contain a small but hitherto unascertained quantity,) assuming also that the spec. grav. of the air is the same as that of water (its real gravity is 1.043, as stated in Turner,) the oil must have contained 11.77 per cent. of prussic acid; but allowing the decimals for the correction of errors, the essence contained previous to treatment 1.1 per cent. of anhydrous prussic acid, being therefore more than half as strong as the P. L. acid. It has been asserted that the pure oil, hydruret of benzoyle, is more liable to be oxidized to benzoic acid than the crude; if so, it would be advisable to keep it in well-closed vessels. During the process I have not observed anything that would indicate a change, although such, in a small degree, is very possible. I would only add that the essence when carefully treated as described will be obtained without contamination, and rather improved in flavor than otherwise. I trust this or some other equally effectual method may be generally adopted, and the public health no longer jeopardized by the sale for use in flavoring food of that which is a deadly poison.

Mr. Edwards, of Liverpool, thought the subject of the purification of oil of bitter almonds from hydrocyanic acid was one of considerable importance, and that its discussion in the presence of practical and scientific men would be productive of much good. He thought it was not creditable to the state of Pharmacy in this country, that in addition to the variable strength of the hydrocyanic acid of the three British Pharmacopœias, there should be a preparation sold for culinary purposes which was nearly as powerful a poison as the medicinal prussic acid itself. Some persons they mitigated the danger resulting from the use of essence of almonds by making it weaker than the usual strength, but he considered it important that it should be of uniform

strength, otherwise those who had been accustomed to use the weaker preparation in considerable quantity, on being supplied with the stronger, would by using it as before, incur great danger. This danger could only be entirely obviated by purifying the oil from prussic acid. When the subject was brought under the notice of Pharmaceutical Chemists some years ago by Mr. Grindley, of Chester, who was then a pupil in the School of Pharmacy, a large establishment at Liverpool commenced selling essence, prepared with the purified oil, but this was afterwards relinquished, the public giving a preference to the essence made with the crude oil, the flavor of which was considered to be better. He trusted that the subject would now be thoroughly investigated and put upon a more satisfactory footing. With reference to the difficulty experienced in distilling the essential oil in glass vessels, which was referred to in Mr. Grove's paper, he would mention a very easy method of obviating that difficulty, arising from the bumping of the liquid, which was to coat the inside of the glass vessel with silver. This may be very readily done by putting into the vessel a solution of nitrate of silver rendered slightly alkaline with ammonia and boiling it for a few minutes with a little honey. The vessel should not be used for a few days after being thus coated, otherwise the silver would be liable to peel off.

Mr. GREAVES stated, that at the request of Mr. Whipple he had tried the effect of the essential oil purified by the process described in this paper. He administered forty minims to a cat, and more than a fluid drachm to a small dog, and in neither case were the effects different from those which any ordinary essential oil would produce, and from which the animals soon recovered.

Dr. NORMANDY observed that experiments on the effects of poisons were frequently made with rabbits, but these animals were, from a peculiarity of their organization, quite unsuited for such experiments. These peculiarities sometimes occurred among animals. Thus it is well known that common parsley was a poison to parrots. The experiments referred to by Mr. Greaves had been judiciously made upon cats and dogs, which animals more nearly represented man in the manner in which they were acted upon by poisons.

Mr. PEDLER thought it more important to effect the purification of the oil than than the essence of almonds, the latter

being so much diluted with spirit as greatly to diminish the danger attending its use.

Dr. NORMANDY could not assent to the last observation. He thought the essence the more dangerous preparation of the two, from its being more palatable, and therefore more likely to be drank. A case had come under his observation in which a servant, finding a bottle of the essence, which he mistook for noyeau, was instantly killed from tasting it.

Mr. ALLCHIN said, as the difficulty attending the distillation of the oil in glass vessels, for the purpose of purifying it, had been alluded to, he might mention that he had found a very easy means of preventing the bumping of the liquid to consist in adding common salt to the liquid, so as to increase the density of the aqueous part.

Mr. REDWOOD thought that something still remained to be determined experimentally, before the subject under the notice of the Meeting could be considered to be satisfactorily settled. It was certainly very desirable that oil of bitter almonds and its preparations, which were principally used for flavoring articles of diet, should be rendered innocuous by the separation of the hydrocyanic acid which the crude oil contained, but it was also important, and indeed essential to the successful application of any process of purification, that the product should retain the true almond flavor, and that it should be sufficiently permanent to admit of its being kept for a reasonable time. Some of the processes which had been proposed for the purpose, did not completely remove the hydrocyanic acid, and this would perhaps serve to explain the differences of opinion which had prevailed with reference to the effects of the purified oil. There was reason to believe that the hydrocyanic acid existed in the crude oil so that Prussian blue was no longer formed in the usual way, if the purified oil was kept for some time, free hydrocyanic acid again appeared. Some of the processes which had been suggested, however, completely removed the whole of the poisonous ingredient, and the oil was then perfectly innocuous, but after being thus purified, it was found to be much more susceptible of oxidation than when in its crude state, indeed, so much so, as greatly to diminish its value as a flavoring substance. The purified essence, after a time, became little else than a solution of

benzoic acid, and no wonder, under such circumstances, that the public preferred the preparations they had been accustomed to, which were not so liable to change. He (Mr. R.) considered that the great desideratum at present was to give the purified oil (the hyduret of benzoyle) a degree of permanence equal to that of the crude or unpurified oil.—*Transactions of the Pharmaceutical Society, April 5th, 1854.*

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ON THE DEODORIZING AND DISINFECTING PROPERTIES OF CHARCOAL, WITH THE DESCRIPTION OF A CHARCOAL RESPIRATOR FOR PURIFYING THE AIR BY FILTRATION.

By JOHN STILES, LL.D., F.R.S.

The powerful effects of freshly-burned wood-charcoal, especially when coarsely powdered, in absorbing gases and vapors, have been long known. Hence the limited extent to which charcoal has been occasionally employed to sweeten foetid water and animal substances in the incipient stages of putrefaction. Sufficient attention has not, I think, however, been hitherto bestowed on a second and still more important effect which charcoal exerts upon those complex products of decomposition, viz. that of rapidly oxidizing them and resolving them into the simplest combinations they are capable of forming.

When coals or wood are burned with an inadequate supply of air, a variable amount of intermediate or secondary products is generated, constituting what are called soot and smoke; when, on the other hand, the combustion of the fuel is conducted with an adequate supply of oxygen and a sufficiently high temperature, carbonic acid, water, ammonia, with perhaps a little nitric acid, are almost the sole-products.

The putrefaction of animal and vegetable substances is likewise in general a process of imperfect oxidation. Hence, under ordinary circumstances, when this is the case, a variety of more or less complex secondary products is formed, which usually possess very disagreeable odors, and exert exceedingly injurious effects upon the animal economy. To these substances the general name of *miasmata* has been given. Not much is known of their nature; but they are believed to be heavy, complex, nitrogenated vapors, which are decomposed by oxygen, chlorine, sulphurous acid, nitric acid, and other disinfecting agents.



My attention was particularly drawn to the importance of charcoal as a disinfecting agent by my friend John Turnbull, Esq., of Glasgow, the well-known extensive chemical manufacturer. Mr. Turnbull, about nine months ago, placed the bodies of two dogs in a wooden box, on a layer of charcoal-powder of a few inches in depth, and covered them over with a quantity of the same material. Though the box was quite open, and kept in his laboratory, no effluvium was ever perceptible; and on examining the bodies of the animals at the end of six months, scarcely anything remained of them except their bones. Mr. Turnbull sent me a portion of the charcoal-powder which had been most closely in contact with the bodies of the dogs. I submitted it for examination to one of my pupils, Mr. Turner, who found it contained comparatively little ammonia, not a trace of sulphuretted hydrogen, but very appreciable quantities of nitric and sulphuric acids, with acid phosphate of lime.

Mr. Turner subsequently, about three months ago, buried two rats in about 2 inches of charcoal-powder, and a few days afterwards the body of a full-grown cat was similarly treated. Though the bodies of these animals are now in a highly putrid state, not the slightest odor is perceptible in the laboratory.

From this short statement of facts, the utility of charcoal-powder, as a means of preventing noxious effluvia from churchyards and from dead bodies in other situations, such as on board ship, is sufficiently evident. Covering a churchyard to the depth of from 2 to 3 inches with coarsely powdered charcoal, would effectually prevent any putrid exhalations ever finding their way into the atmosphere. Charcoal-powder also greatly favors the rapid decomposition of the dead bodies with which it is in contact, so that in the course of six or eight months little is left except the bones.

In all the modern systems of chemistry, such, for instance, as the last edition of Turner's 'Elements,' charcoal is described as possessing antiseptic properties, while the very reverse is the fact. Common salt, nitre, corrosive sublimate, arsenious acid, alcohol, camphor, creosote, and most essential oils are certainly antiseptic substances, and therefore retard the decay of animal and vegetable matters. Charcoal, on the contrary, as we have just seen, greatly facilitates the oxidization, and consequently



the decomposition, of any organic substances with which it is in contact. It is, therefore, the very opposite of an antiseptic.

The object of the present paper, however, is chiefly an application of the absorbent and oxidizing properties of charcoal, which, so far as I am aware, has never yet been proposed, viz. to employ a new species of respirator, filled with powdered animal charcoal, to absorb and destroy any miasmata or infectious particles present in the air in the case of fever and cholera hospitals, and of districts infected by ague, yellow fever, and similar diseases. I have got such a respirator made by Ferguson and Sons, Smithfield, instrument-makers to St. Bartholomew's Hospital. It fits closely to the lower portion of the face, extending from the chin to within half an inch of the eyes, and projects about an inch on either side of the mouth. It therefore includes the nostrils as well as the mouth. The frame of the respirator is made of thin sheet copper, but the edges are formed of lead, and are padded and lined with velvet, so that it can be made to fit tightly to the face. The powdered charcoal is kept in its place by means of two sheets of fine wire gauze, from a quarter to an eighth of an inch apart. As the body of the apparatus is metallic, it has been electro-plated with silver. Electro-plating the respirator with platinum or gold would certainly be an improvement. There is a small opening closed with a wire-gauze screw, by means of which the respirator can be filled with charcoal or emptied at pleasure. The respirator is kept in its place by an elastic band passing round the back part of the head. I have employed *animal* charcoal as the more porous substance, but I should think wood-charcoal would answer perfectly well.\* The object in view is, by filtering the air through such a porous substance as animal charcoal, to intercept the miasmata which may have got mixed with it. These, I think, cannot fail to be absorbed by the pores of the charcoal, where they will be rapidly oxidated and destroyed by the condensed oxygen with which they will be brought into the most intimate contact. The probability of this expectation being realized is greatly strengthened by the results of repeated trials with the respirators on certain noxious and offensive gases,

\* Since the above was written, I have ascertained by experiment that common wood-charcoal is even more efficacious than animal charcoal.—J. S.

such as ammonia, sulphuretted hydrogen, hydrosulphate of ammonia and chlorine. I have found that air strongly impregnated with these gases, and which could not be respired for any length of time under ordinary circumstances, may be breathed with impunity when the charcoal respirator is worn, the odor of these gases being rendered almost, if not altogether, imperceptible. Any other highly porous substance, such for instance as sponge platinum, or pounded pumice-stone, might probably be found to answer perfectly well for filling the respirator; but I have selected charcoal as the cheapest and most easily available material.

While the filtration of water through charcoal powder and other porous substances has been advantageously practised for many centuries, the object in view being to deprive the water of numerous impurities diffused through it, which produce injurious effects on the animal economy, it is certainly somewhat remarkable that the very obvious application of a similar proceeding to the lighter fluid in which we live, viz. air, which not unfrequently contains even more noxious impurities floating in it than are usually present in water, should have, up to the present time, been so unaccountably overlooked.

In addition to the precaution of wearing such a respirator as that just described, persons necessitated to live in especially pestiferous districts might have their houses made as air-tight as possible, with the exception of such openings as are necessary to maintain a proper amount of ventilation. By means of these openings the air could be freely admitted through gauze into which the requisite quantity of charcoal had been quilted. The doors of such houses could also be made double, and be constructed of coarse cloth, likewise containing a thin layer of charcoal powder. As an additional precaution, if it were thought desirable, the walls, floors, and ceilings of houses in very unhealthy districts could be easily lined with mattresses filled with a couple of inches of charcoal powder. Were these and similar precautions adopted, I confidently anticipate that Europeans will be enabled to reside with comparative impunity in some of the hitherto most pestilential districts in the world.—*Chem. Gaz.* April 1854, from *Journal of the Society of Arts*, Feb. 24, 1854.

## ON THE CINCHONA BARKS OF NEW GRANADA.

BY EZEQUIEL URICOECHEA, OF BOGOTÁ.

The increasing commerce in the Cinchona barks of New Granada, and a desire to contribute something to the knowledge of them, are my reasons for writing these lines.

Much has been lately said of the Bogotá, Cinchona bark (*China Bogotensis*), in which the new base *quinidine* has been found. As the new alkaloid differs from quinine, and was thought to be much inferior to it in medicinal properties, there was a check on the commerce in the Cinchona barks coming from New Granada, all of them passing under the name of *China Bogotensis*; more recently, however, considerable quantities have been exported to England. That the barks which *now* come from that country differ from one another, I hope to show in what follows, for of the *old* cinchona trees from New Granada, it is too well known that there were a great many species, the barks of which were then exported.

Having received by private means, and not through a mercantile house, seven specimens of bark direct from Bogotá, Professor Wiggers, of Göttingen, had the kindness to examine them; and as I have had the opportunity of comparing them with other known specimens in his possession, I entertain no doubt of the correctness of his determination.

In addition to the barks I obtained an ounce of the sulphate of quinine made by Manuel Umana and Co., in the Tequendama manufactory, regarding a qualitative analysis of which I may be permitted a few lines.

1. *China pseudoregia*. From *Chipaque*, sixteen leagues from Bogotá. There are some seven subordinate barks that come under this name. According to Reichel's analysis it contains per cent.—quinine, 1.01, cinchonine, 0.63, quinic acid, 1.29.

2. *China flava dura*. From *Suaque*, ten leagues from Bogotá. This cinchona contains, according to Pelletier and Caventou, the discoverers of quinine, and to whom we owe the first scientific investigations of these barks, quinate of quinine and of cinchonine.

3. *China Cartagena*. From *Chipaque*. Here we see, that in the same place there are two kinds of bark collected—this and the *pseudoregia*; and probably in the woods trees of very differ-

ent species grow by each other, so that these specific names taken from localities are worse than none, for they confuse instead of clear up the subject. This Cinchona bark is but a variety of the *China flava dura*.

4. *China Bogotensis*. From *Fusagasugá*, eight leagues from Bogotá. Of the whole number of specimens that I obtained, this is the only one which has been recognized as the Bogotá bark, which has given rise to so many contradictory views with respect to the bases which it contains.

5. *China rubiginosa*. Found ten leagues from Bogotá.

6. *China rubiginosa*. From *El Acerradero*, also ten leagues distant. Having these two specimens, I am able to give the locality of this bark, until now unknown. We can therefore say with certainty, that it comes from New Granada, and that M. Von Bergen was right when he asserted that this bark was exported thence, although it can also be said that the same species has come from and is produced at Cusco, in Peru.

The chemical constitution has been but little studied: from an imperfect analysis it appears to contain—according to Franck—in 100 pounds, forty-eight to fifty ounces of cinchonine. The large quantity of cinchonine here found is improbable.

7. *China rubiginosa*. From New Granada, exact locality unknown.

*Sulphate of Quinine of the Tequendama Manufactory*. It is very white, porous, and crystallized in small needles, the planes of which possess a vitreous lustre. By the well known test with ammonia and sulphuric ether, the solution of the salt was so complete, that the very small quantity that remained between the two liquids was only extraneous matter. The ethereal solution was allowed to evaporate, and it left only a residue of amorphous quinine, with no traces of crystals, which well proves the absence of quinidine. By this test then, we have to consider the sulphate of quinine manufactured in New Granada as on a parallel with similar European preparations.

*Résumé*. We find from what precedes, or at least we have good reason to suppose, that the seeming contradictions which have been published about the Cinchona bark of Bogotá and of its chemical constitution, are easily accounted for by considering the varieties of bark coming into commerce under the same name

from the same district. Secondly, that the barks that are now-a-days exported from New Granada are not all *China Bogotensis*, but are so different from one another, that we must acknowledge that they come from different trees; a few of these barks, those growing in the plateau of Bogotá or its vicinity, I have noticed above. And further, that *because* the barks come from New Granada they should not be underrated, for they contain some of the best sorts. Schüffele and Bouquet have shown, that some barks obtained by them direct from the exporter Lopez, of New Granada, are as rich in quinine and cinchonine as the *China calisaya vera*, while naturally, others are not so rich and some are poor ones.

Finally, with regard to the composition of the impure sulphate of quinine of New Granada, it must be expected to vary, and much, according to the *different* kinds of bark employed at this or that time of manufacturing. However, the sulphate of quinine, such as given by the manufactory of Taquendama to-day is quite pure; and it is with no small degree of pleasure that I can say, that our country not only produces the source of the renowned *specific*, but the men and the mind to preserve it, and to distribute it to our fellow-creatures.—*Pharmaceutical Journal*, April 1, 1854.

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#### THE MANUFACTURE OF PYROGALLIC ACID.

By H. GRUNEBERG.

As the material for the manufacture of pyrogallie acid, I employ Chinese galls, which are coarsely powdered, twice extracted with boiling of water, and then expressed. The extract obtained is evaporated to dryness, and pulverized. It amounts to rather more than 30 pounds for every 50 pounds of gall treated.

As the apparatus I use a flat basin of sheet iron, whose bottom has a diameter of 18 inches, with an upright rim 3 inches high. At a height of  $1\frac{1}{2}$  inch from the bottom of the dish, the rim bears at the external side a tube an inch long, and an inch in diameter, directed somewhat upwards, which communicates with the interior of the dish, and serves to receive a thermometer, by means of a cork.

At the bottom of the dish half a pound of the pulverized ex-

tract is evenly spread, then the thermometer is placed somewhat near, so that its bulb reaches nearly to the middle of the apparatus, and half-an-inch from the bottom. The dish is covered with an ordinary piece of gauze, and then with a paper hat, about 15 inches high. The apparatus is placed on a sheet of iron, which is strewed with half-an-inch of dry sand, and this is set on a furnace.

A tolerably strong fire is kept up, until the thermometer rises to about  $295^{\circ}$  Fahr., upon which the heat must be quickly moderated. The thermometer soon raises to about  $390^{\circ}$ , and the acid rapidly sublimes. The latter temperature is maintained for three hours; and after this time a considerable quantity of colorless pyrogallie acid is found in the hat. By this method 50 pounds of Chinese galls will yield 2 pounds of pyrogallie acid. —*Annals of Pharm. from Journal für Praktische Chemie.*

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#### THE FORMATION OF SULPHOCYANURET OF POTASSIUM IN THE WET WAY.

BY DR. LOWE.

When a watery solution of a weighed quantity of ferrocyanuret of potassium is mixed with sulphuret of potassium in the usual proportions, or with sulphur and carbonate of potash, and the mixture heated to boiling, the solution, after a few minutes, becomes greenish, under the separation of sulphuret of iron, the quantity of which increases according to the length of the boiling of the liquid. After long-continued boiling, all the ferrocyanuret of potassium is completely replaced by the sulphocyanuret of potassium. If the suspended sulphuret of iron is now separated by filtration from the fluid, the latter allowed, in case it should be still colored yellow, to stand in the air a short time until it is colorless, the whole evaporated to dryness in a water-bath, and the residue extracted with alcohol, a tolerably saturated alcoholic solution of sulphocyanuret of potassium is thus obtained. The residue insoluble in alcohol contains very small quantities of ferrocyanuret of potassium, whose decomposition and conversion should be effected by further boiling. A solution of ferrocyanuret of potassium, boiled with sulphur alone, is converted into sulphocyanuret of potassium, under the simul-

taneous separation of sulphuret of iron, which appears to color the suspended sulphur black, still the quantity of sulphocyanuret of potassium resulting therefrom is, even after continued boiling, very inconsiderable.—*Ibid from Ibid.*

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FLUID MAGNESIA.

By DR. THOMAS ANTISEL.

This medicament, introduced to the profession by Sir James Murray, and generally adopted, is at all times manufactured of very variable strength. By Sir J. M., who held a patent for its manufacture in Great Britain and Ireland, it was stated to be furnished at the strength of 14 grains to the ounce. Its manufacture being commenced in this city about a year since, and having received a bottle from the manufacturers, I determined the amount of solid matter and of magnesia which a given quantity would yield.

1. On evaporating one ounce of fluid to dryness the residue being ignited in a porcelain crucible, weighed 4.50 grains.

2. Digested 1 oz. for an hour to expel the carbonic acid, which precipitated a portion of the magnesia; then added caustic potass until the precipitation ceased; precipitate collected, dried, ignited, and weighed = 4.33.

3. The residue of experiment 1, treated with weak hydrochloric acid, did not wholly dissolve, but left a white gritty powder to 15; this dissolved in boiling hydrochloric acid, and on evaporation to dryness and ignition, it was insoluble in the same acid; this portion was silica.

Now, as 100 parts of ordinary carbonate of magnesia contain 41.6 of caustic magnesia ( $MgO$ ), so from experiment 2, 4.33 gr. would supply 10.41 grains of carbonate of magnesia in 1 oz. of liquid. This "American Fluid Magnesia," as it is termed, does not, therefore, contain the full amount of magnesia, which the condensed gas would dissolve, by nearly one-third.

Since the solvent powers of carbonic acid upon the earths have been so happily introduced into medicine, it is worth considering whether a solution of phosphate of lime in carbonic acid might not be used with advantage.—*N. Y. Jour. of Pharm.*



## Varieties.

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On Perfumery. By SEPTIMUS PIESSE.

(Continued from page 279.)

CASSIA.—The essential oil of cassia is produced by distilling the outer bark of the *Cinnamomum cassia*. 1 cwt. of bark yields rather more than three quarters of a pound of oil; it has a pale yellow color; in smell it much resembles cinnamon, although very inferior to it. It is principally used for perfuming soap, especially what is called "military soap," as it is more aromatic or spicy than flowery in odor; it therefore finds no place for handkerchief use.

CARAWAY.—This odoriferous principle is drawn by distillation from the seeds of the *Carum carui*. It has a very pleasant smell, quite familiar enough without description. It is well adapted to perfume soap, for which it is much used in England, though rarely, if ever, on the continent; when dissolved in spirit it may be used in combination with oil of lavender and bergamot for the manufacture of cheap essences, in a similar way to cloves (see *Cloves*). If caraway seeds are ground, they are well adapted for mixing to form sachet powder (see *Sachets*).

CASCARILLA.—The bark alone of this plant is used by the manufacturing perfumer, and that only in the fabrication of pastilles. The *Cascarilla gratissimus* is however so fragrant, that Burnett says its leaves are gathered by the Koras of the Gape of Good Hope as a perfume, and both the *C. fragrans* and *C. fragilis* are odoriferous. It behoves perfumers, therefore, who are on the look out for novelties, to obtain these leaves, and ascertain the result of their distillation.

Messrs. Herring and Co., some years ago, drew the oil of cascarilla, but it was only offered to the trade as a curiosity.

CEDAR WOOD now and then finds a place in a perfumer's warehouse; when ground it does well to form a body for sachet powder. Slips of cedar wood are sold as matches for lighting lamps, because while burning an agreeable odor is evolved; some people use it also in this condition, distributed among clothes and drawers to "prevent moth." On distillation it yields an essential oil, but it is little if ever used.

The tincture smells agreeably of the wood, from which it can readily be made. Its crimson color, however, prohibits it from being used for the handkerchief. It forms an excellent tincture for the teeth, and is the basis of the celebrated French dentifrice "eau botot."

CEDRAT.—This perfume is procured from the rind of the citron fruit (*Citrus medica*), both by distillation and expression; it has a very beautiful lemony odor, and is much admired. It is principally used in the manu-

facture of essences for the handkerchief, being too expensive for perfuming grease or soap. What is called extract of cedrat is made by dissolving two ounces and a half of the above essential oil of citron in one gallon of spirits, to which some perfumers add half an ounce of bergamot.

CINNAMON.—Several species of the plant *Laurus cinnamomum* yields the cinnamon and cassia of commerce. Its name is said to be derived from *China amomum*, the bark being one of the most valued spices of the East. Perfumers use both the bark and the oil, which is obtained by distillation from it. The bark ground enters into the composition of some pastilles, tooth powders and sachets. The essential oil of cinnamon is principally brought to this country from Ceylon; it is exceedingly powerful and must be used sparingly. If such compounds as cloves answer, so will cinnamon.

CITRON.—On distilling the flowers of the *Citrus medica*, a slightly fragrant oil is procured, which is a species of neroli, and is principally consumed by the manufacturers of eau de Cologne.

CITRONELLA.—Under this name there is an oil in the market, chiefly derived from Ceylon and the East Indies; its true origin we are unable to decide; in odor it somewhat resembles citron fruit, but is very inferior. Probably it is procured from one of the grasses of the *Andropogon* genus. Being cheap it is extensively used for perfuming soap. What is now extensively sold as "honey" soap, is a fine yellow soap slightly perfumed with this oil. Some few use it for scenting grease, but it is not much admired.

CLOVES.—Every part of the clove plant (*Carophyllus aromaticus*) abounds with aromatic oil, but it is most fragrant and plentiful in the unexpanded flower bud, which are the cloves of commerce. Cloves have been brought into the European markets for more than 2,000 years. The plant is a native of the Moluccas and other islands in the Chinese seas. "The average annual crop of cloves is, from each tree, 2 or 2½ lbs., but a fine tree has been known to yield 125 lbs. of this spice in a single season, and as 5,000 cloves only weigh one pound, there must have been at least 625,000 flowers upon this single tree." (Burnett.)

The oil of cloves may be obtained from the fresh flower buds, but the usual method of procuring it is by distillation, and which is carried on to a very great extent in this country. Few essential oils have a more extensive use in perfumery than that of cloves; it combines well with grease, soap, and spirit, and, as will be seen in the recipes for the various bouquets given hereafter, it forms a leading feature in some of the most popular handkerchief essences, Rondeletia, the Guard's Bouquet, &c., and will be found where least expected. For essence of cloves, dissolve oil of cloves in the proportion of two ounces of oil to one gallon of spirit.

DILL.—Perfumers are now and then asked for "dill water;" it is, however, more a druggist's article than a perfumer's, as it is more used for its medicinal qualities than for its odor, which, by the way, is rather pleasant

than otherwise. Some ladies use a mixture of half dill water and half rose water, as a simple cosmetic, "to clear the complexion."

The oil of dill is procured by submitting the crushed fruit of dill (*Anethum graveolens*) with water to distillation. The oil floats on the surface of the distillate, from which it is separated by the funnel in the usual manner; after the separation of the oil, the "water" is fit for sale. Oil of dill may be used with advantage, if in small proportions, and mixed with other oils, for perfuming soap.

EGLANTINE, OR SWEET BRIAR, notwithstanding what the poet Robert Noyes says—

"In fragrance yields,  
"Surpassing citron groves or spicy fields,"

does not find a place in the perfumer's "scent-room" except in name. This, like many other sweet scented plants, does not repay the labor of collecting its odor. The fragrant part of this plant is destroyed, more or less, under every treatment that it is put to, and hence is discarded. As, however, the article is in demand by the public, a species of fraud is practised upon them, by imitating it thus:—

*Imitation Eglantine, or Essence of Sweet Briar.*

Spirituuous extract of French rose pomatum	.	.	.	1 pint.
" " cassie	.	.	.	¼ "
" " fleur d'orange	.	.	.	¼ "
Esprit de rose	.	.	.	¼ "
Oil of neroly	.	.	.	½ drachm.
Oil of lemon grass (verbena oil)	.	.	.	½ "

ELDER (*Sambucus nigra*).—The only preparation of this plant for its odorous quality used by the perfumer, is elder-flower water. To prepare it, take nine pounds of elder-flowers, free from stalk, and introduce it to the still with four gallons of water; the first three gallons that come over is all that need be preserved for use; one ounce of rectified spirit should be added to each gallon of "water" distilled, and when bottled is ready for sale. Other preparations of elder-flowers are made, such as milk of elder, extract of elder, &c., which will be found in their proper places under Cosmetics. Two or three new materials made from this flower will also be given hereafter, which are likely to meet with a very large sale on account of the reputed cooling qualities of the ingredients; of these we would call attention more particularly to cold cream of elder flowers, and to elder oil for the hair.

The preparation of elder-flowers, if made according to the Pharmacopœias, are perfectly useless, as the forms therein given are quite absurd, and show an utter want of knowledge of the properties of the materials employed; we must, therefore steer clear of the Pharmacopœias, in our manufacture of elder-flower cosmetics.

FENNEL (*Feniculum vulgare*).—Dried Fennel herb, when ground, enters

into the composition of some sachet powders. The oil of fennel, in conjunction with other aromatic oils, may be used for perfuming soap. It is procurable by distillation.

FLAG-SWEET (*Acorus calamus*).—The roots, or rizome, of the sweet flag, yield by distillation a pleasant smelling oil; 1 cwt. of the rizome will thus yield one pound of oil. It can be used according to the pleasure of the manufacturer in scenting grease, soap, or for extraits, but requires other sweet oils with it to hide its origin.

GERANIUM (*Pelargonium odoratissimum*), rose-leaf geranium.—The leaves of this plant yield by distillation a very agreeable rosy-smelling oil, so much resembling real otto of rose that it is used very extensively for the adulteration of that valuable oil, and is grown very largely for that express purpose. It is principally cultivated in the South of France, and in Turkey (by the rose-growers). In the department of the Seine-et-Oise, at Montfort-Lamaury, in France, hundreds of acres of it may be seen growing. 1 cwt. of leaves will yield about two ounces of essential oil. Used to adulterate otto of rose, it is in its turn itself adulterated with ginger grass oil (*Andropogon*), and thus formerly was very difficult to procure genuine; on account of the increased cultivation of the plant, it is now, however, easily procured pure. Some samples are greenish colored, others nearly white, but we prefer that of a brownish tint.

When dissolved in rectified spirit, in the proportion of about three ounces to the gallon, it forms the "extract of rose-leaf geranium" of the shops. A word or two is necessary about the oil of geranium, as much confusion is created respecting it, in consequence of there being an oil under the name of geranium, but which in reality is derived from the *Andropogon nardus*, cultivated in the Moluccas. This said andropogon (geranium!) oil can be used to adulterate the true geranium, and hence we suppose its nomenclature in the drug markets. The genuine rose-leaf geranium oil is fetching about 8s. per ounce, while the andropogon oil is not worth more than half that sum per pound. And we may observe here, that the perfuming essential oils are best purchased through the wholesale perfumers, as from the nature of their trades they have a better knowledge and means of obtaining the real article than the drug broker. On account of the pleasing odor of the true oil of rose-leaf geranium, it is a valuable article for perfuming many materials, and it appears to give the public great satisfaction.

HELIOTROPE.—Either by maceration or en-fleurage with clarified fat, we may obtain this fine odor from the flowers of the *Heliotrope Peruvianum* or *H. grandiflorum*. Exquisite as the odor of this plant is, at present it is not applied to use by the manufacturing perfumer. This we think rather a singular fact, especially as the perfume is powerful and the flowers abundant. We should like to hear of some experiments being tried with this plant for procuring its odor in this country, and for that purpose now suggest the mode of operation which would most likely lead to successful re-

sults. For a small trial in the first instance, which can be managed by any person having the run of a garden, procure an ordinary glue pot now in common use, which melts the material by the boiling of water; it is in fact a water bath, in chemical parlance; one capable of holding a pound or more of melted fat. At the season when the flowers are in bloom obtain half a pound of fine mutton suet, melt the suet and strain it through a close hair-sieve, allow the liquefied fat as it falls from the sieve to drop into cold spring water; this operation granulates and washes the blood and membrane from it. In order to start with a perfectly inodorous grease, the melting and granulation process may be repeated three or four times; finally, remelt the fat and cast it into a pan to free it from adhering water. Now put the clarified suet into the macerating pot, and place it in such a position near the fire of the greenhouse or elsewhere that will keep it warm enough to be liquid; into the fat throw as many flowers as you can, and there let them remain for twenty-four hours; at this time strain the fat from the spent flowers and add fresh ones: repeat this operation for a week; we expect at the last straining the fat will have become very highly perfumed, and when cold may be justly termed *Pomade à la Heliotrope*.

The cold pomade being chopped up, like suet for a pudding, is now to be put into a wide-mouth bottle, and covered with spirits as highly rectified as can be obtained, and left to digest for a week or more; the spirit then strained off will be highly perfumed; in reality it will be *extract of heliotrope*, a delightful perfume for the handkerchief. The rationale of the operation is simple enough; the fat body has a strong affinity or attraction for the odorous body, or essential oil of the flowers, and it, therefore, absorbs it by contact and becomes itself perfumed. In the second operation, the spirit has a much greater attraction for the fragrant principle than the fatty matter; the former, therefore, becomes perfumed at the expense of the latter. The same experiment may be repeated with almond oil substituted for the fat.

The experiment here hinted at, may be varied with any flowers that there are to spare; indeed, by having the macerating bath larger than was mentioned above, an excellent *millefleur* pomade and essence might be produced from every conservatory in the kingdom, and thus we may receive another enjoyment from the cultivation of flowers beyond their beauty of form and color.

We hope that those of our readers who feel inclined to try experiments of this nature will not be deterred by saying, "they are not worth the trouble," as we affirm this to be incorrect. It must be remembered, that very fine essences realize in the London perfumery warehouses 24s. per pint of sixteen ounces, and that fine *flowery-scented* pomades fetch the same sum per pound. Heliotrope, and many other sweet scented plants, are just now coming into season; and if the experiments are successful they should

be published, as then we may hope to establish a new and important manufacture in this country. But we are digressing.

The odor of heliotrope resembles a mixture of almonds and vanilla, and is well imitated thus :

*Extract of Heliotrope.*

Spirituos extract of vanilla	. . . . .	½ pint.
“ “ French rose pomatum	. . . . .	¼ “
“ “ orange flower pomatum	. . . . .	2 oz.
“ “ ambergijs	. . . . .	1 oz.

Essential oil of almonds . . . . . 5 drops.

A preparation made in this manner under the name of *Extrait de Heliotrope* is that which is sold in the shops of Paris and London, and is really a very nice perfume, passing well with the public for a genuine extract of heliotrope.

HOVENIA.—A perfume under this name is sold to a limited extent, but if it did not smell better than the plant *Hovenia dulcis et inequalis*, a native of Japan, it would not sell at all. The article in the market is made thus :

Rectified spirit	. . . . .	1 quart.
Rose water	. . . . .	½ pint.
Essential oil of lemons	. . . . .	½ oz.
Otto of rose	. . . . .	1 drachm.
Oil of cloves	. . . . .	½ “
“ neroly	. . . . .	10 drops.

After filtration it is ready for sale. When compounds of this kind do not become bright by passing through blotting-paper, the addition of a little carbonate of magnesia effectually clears them. The water in the above recipe is only added in order that the article produced may be retailed at a moderate price, and would, of course, be better without that “universal friend.”

HONEYSUCKLE OR WOODBINE.—

“ Copious of flower the woodbine, pale and wan,  
But well compensating her sickly looks  
With never-cloying odors.”

What the poet Cowper here says is quite true, nevertheless, it is a flower that is not used in practical perfumery, though there is no reason for abandoning it. The experiments suggested for obtaining the odor of Heliotrope and Millefleur (thousand flowers) are also applicable to this, as also to Hawthorne. A good IMITATION OF HONEYSUCKLE is made thus :—

Spirituos extract of rose pomatum	. . . . .	1 pint.
“ “ violet	“ . . . . .	1 “
“ “ tubereuse	“ . . . . .	1 “
Extract of vanilla	. . . . .	¼ “
“ tolu	. . . . .	¼ “
Oil of neroli	. . . . .	10 drops.
Essential oil of almonds	. . . . .	5 “

The prime cost of a perfume made in this manner would probably be too high to meet the demand of a retail druggist; in such cases it may be diluted with rectified spirit to the extent "to make it pay," and will yet be a nice perfume. The formula generally given herein for odors is in anticipation that when bottled they will retail for at least eighteenpence the fluid ounce! which is the average price put on the finest perfumery by the manufacturers of London and Paris.

#### JASMIN.—

"Luxuriant above all,

The Jasmin throwing wide her elegant sweets."

This flower is one of the most prized by the perfumer. Its odor is delicate and sweet, and so peculiar that it is without comparison, and as such cannot be imitated. When the flowers of the *Jasminide odoratissimum* are distilled, repeatedly using the water of distillation over fresh flowers, the essential oil of jasmin may be procured. It is, however, exceedingly rare, on account of the enormous cost of production. There was a fine sample of six ounces exhibited in the Tunissian department of the Crystal Palace, the price of which was 9*l.* the fluid ounce! The plant is the Yasmyn of the Arabs, and from which our name is derived.

In the perfumer's laboratory the method of obtaining the odor is by absorption, or, as the French term it, *enfleurage*; that is, by spreading a mixture of pure lard and suet on a glass tray, and sticking the fresh-gathered flowers all over it, leaving them to stand a day or so, and repeating the operation with fresh flowers—the grease absorbs the odor. Finally the pomade is scraped off the glass or slate, melted at as low a temperature as possible, and strained.

Oils, strongly impregnated with the fragrance, are also prepared much in the same way. Layers of cotton wool, previously steeped either in olive oil or oil of ben (obtained by the pressure from the blanched nuts of the *Moringa oleifera*), are covered with jasmin flowers, which is repeated several times; finally, the cotton or linen cloths, which some perfumers use, are squeezed under a press. The jasmin oil thus produced is the *Huile antique au jasamin* of the French houses.

The "extract of jessamine" is prepared by pouring rectified spirit on the jasmin pomade or oil, and allowing them to remain together for a fortnight at a summer heat. The best quality extract requires two pounds of pomatum to every quart of spirit. The same can be done with the oil of jasmin. If the pomade is used, it must be cut up fine previously to being put into the spirit: if the oil is used, it must be shaken well together every two or more hours, otherwise, on account of its specific gravity, the oil separates, and but little surface is exposed to the spirit. After the extract is strained off, the "washed" pomatum or oil is still useful, if re-melted, in the composition of pomatum for the hair, and gives more satisfaction to a customer than any of the "creams and balms," &c., &c., made up and scented with essential oils; the one smells of a flower, the other "a nondescript."



The extract of *jasmin* enters into the composition of a great many of the most approved handkerchief perfumes sold by the English and French Perfumers. Extract of *jasmin* is sold for the handkerchief often pure, but is one of those scents which, though very gratifying at first, becomes what people call "sickly" after exposure to the oxidizing influence of the air, but if judiciously mixed with other perfumes of an opposite character is sure to secure the most fastidious customer.

**JONQUIL.**—The Parisian perfumers sell a mixture which they call "extract of jonquil." The plant, however, only plays the part of a godfather to the offspring, giving it its name. The so called jonquil is made thus :

Spirituous extract of <i>jasmin</i> pomade	.	.	1 pint.
" " of tubereuse "	.	.	1 pint.
" " of fleur d'orange	.	.	$\frac{1}{2}$ pint.
Extract of vanilla	.	.	2 fluid ounces.

**LAUREL.**—By distillation from the berries of the *Laurus nobilis*, and from the leaves of the *Laurus cerasus*, an oil and perfumed water are procurable of a very beautiful and fragrant character. Commercially, however, it is disregarded, as from the similarity of odor to the oil distilled from the bitter almond, it is rarely, if ever, used by the perfumer, the latter being more economical.

**LAVENDER.**—The climate of England appears to be better adapted for the perfect development of this fine old favorite perfume than any other on the globe. "The ancients employed the flowers and the leaves to aromatize their baths, and to give a sweet scent to water in which they washed ; hence the generic name of the plant, *Lavandula*."—Burnett.

Lavender is grown to an enormous extent at Mitcham, in Surrey, which is the seat of its production, in a commercial point of view. Very large quantities are also grown in France, but the fine odor of the British produce realizes in the market four times the price of that of Continental growth. Burnett says that the oil of *Lavandula spica* is more pleasant than that derived from the other species, but this statement must not mislead the purchaser to buy the French spike *veræ*. Half a hundred weight of good lavender flowers yield, by distillation, from 14 to 16 oz. of essential oil.

All the inferior descriptions of oil of lavender are used for perfuming soaps and greases ; but the best—that obtained from the Mitcham lavender—is entirely used in the manufacture of what is called lavender water, but which, more properly, should be called essence or extract of lavender, to be in keeping with the nomenclature of other essences being prepared with spirit.

The number of formulæ published for making a liquid perfume of lavender is almost endless, but the whole of them may be resolved into essence of lavender, simple ; essence of lavender, compound ; and lavender water.

There are two methods of making essence of lavender—1. By distilling a

mixture of essential oil of lavender and rectified spirit; and the other—2. By merely mixing the oil and the spirit together.

The first process yields the finest quality; it is that which is adopted by the firm of Smyth & Nephew, whose reputation for this article is such that it gives a good character in foreign markets, especially in India, to all products of lavender of English manufacture. Lavender essence, that which is made by the still, is quite white, while that by mixture only, always has a yellowish tint, and which by age becomes darker and resinous.

*Smyth's Lavender.*

To produce a very fine distillate, take—

Essential oil of English lavender	.	.	.	4 oz.
Rectified spirit (60 over proof)	.	.	.	5 pints.
Rose water	.	.	.	1 pint.

Mix and distil five pints for sale. Such essence of lavender is expensive, but at 10s. a pint of 14 oz. there is a margin for profit. It not being convenient to the general dealer to sell distilled lavender essence, the following form, by mixture, will produce a first-rate article:—

*Essence of Lavender.*

Essential oil of lavender.	.	.	.	3½ oz.
Rectified spirit	.	.	.	2 quarts.
Rose water	.	.	.	½ pint.
Tincture of orris	.	.	.	½ pint.

If not quite bright, filter the mixture through a little carbonate of magnesia strewed upon an ordinary filtering paper.

The perfumers retail price for such quality, is 8s. per pint of 14 oz.

LAVENDER WATER.—Take—

English oil of lavender	.	.	.	4 oz.
Spirit	.	.	.	3 quarts.
Rose water	.	.	.	1 pint.

Filter as above, and it is ready for sale.

COMMON LAVENDER WATER.—Same form as above, substituting oil of French lavender for the British.

Recipes for Rondeletia, Lavender Boquet, and other lavender compounds, will be given when we come to compound perfumes, which, to be beneficial to the practical reader, will be reserved until we have finished explaining the method of making the simple essences.

LEMON.—This fine perfume is abstracted from the *Citrus limonum*, by expression, from the rind of the fruit. The essential oil of lemons in the market is principally from Messina, where there are hundreds of acres of "lemon groves." Oil of lemons, like all the oils of the Citrus family, is rapidly prone to oxidation when in contact with air and exposure to light; a high temperature is also detrimental; and as such is the case it should be preserved in a cool cellar. Most of the samples from the gas-heated shelves of the druggists' shops are as much like essence of turpentine to the smell

as that of lemons; rancid oil of lemons may, in a great measure, be purified by agitation with warm water and final decantation. When new and good, lemon oil may be freely used in combination with rosemary, cloves, and caraway, for perfuming powders for the nursery. From its rapid oxidation, it should not be used for perfuming grease, as it assists rather than otherwise all fats to turn rancid; hence, pomatums so perfumed do not keep well. In the manufacture of other compound perfumes, it should be dissolved in spirit, in the proportion of six to eight ounces of oil to one gallon of spirit. There is a large consumption of oil of lemons in the manufacture of Eau de Cologne; that Farina uses it is easily discovered by adding a few drops of Liq. Ammonia fort. to half an ounce of his Eau de Cologne, the smell of the lemon is thereby brought out in a remarkable manner. Perhaps it is not out of place here to remark, that in attempts to discover the composition of certain perfumes, we are greatly assisted by the use of strong Liq. Pottassæ or Liq. Ammonia, certain of the essential oils combining with the alkalies, allow those which do not do so, if present in the compound, to be smelt.

LEMON GRASS.—According to Pereira, the essential oil in the market under this name is derived from the *Andropogon schoenanthus*, a species of grass which grows abundantly in India. It is cultivated to a large extent in Ceylon and the Moluccas purposely for the oil, which from the plant is easily procured by distillation. Lemon grass oil, or, as it is sometimes called, oil of verbenæ, on account of its similarity of odor to that favorite plant, is imported into England in old English porter and stout bottles. It is very powerful, well adapted for perfuming soaps and greases, but its principal consumption is in the manufacture of artificial essence of verbenæ. From its comparatively low price, great strength, and fine perfume (when diluted), the lemon grass oil may be much more used than at present, with considerable advantage to the retail shopkeeper.

LILAC.—The fragrance of the flowers of this ornamental shrub (*syringa*) is well known. The essence of lilac is obtained either by the process of maceration, or enfleurage with grease, and afterwards treating the pomatum thus formed with rectified spirit, in the same manner as previously described for cassie; the odor so much resembles tubereuse, as to be frequently used to adulterate the latter, the demand for tubereuse being at all times greater than the supply. A beautiful IMITATION OF ESSENCE OF WHITE LILAC may be compounded thus—

Spirituous extract from tubereuse pomade	:	.	1 pint.
“ of orange flour pomade	.	.	$\frac{1}{4}$ pint.
Essential oil of almonds	.	.	drops
Extract of civet	.	.	$\frac{1}{2}$ oz.

The civet is only used to give permanence to the perfume of the handkerchief.—*Annals of Pharmacy.* (To be continued.)

*Acclimation of the Deodar.*—In England they are trying an experiment on a large scale worthy of notice. At the instigation of the Government, the East India Company have brought home one ton of seeds of the Deodar, which were gathered on the Himalaya mountains, and which are intended to plant on the hills and ground of the unproductive land of Great Britain. The deodar is the cedar of the Himalayas. The horticulturists are well acquainted with it, but up to this time it has been used as an ornament of the garden merely. The rare elegance of this noble tree is appreciated by every one; it attains a height of sixty-five yards, to two or three yards in diameter. The wood is very hard, and almost incorruptible, as the monuments of traditionally many years old have not been in the least degree injured by time; it resists the action of water to an almost indefinite time. When England shall have replenished their ancient forests with this magnificent tree, she will have gained immense assistance to her maritime interests. It is supposed that the seeds brought by the East India Company will germinate and produce six million trees.—*N. Y. Journal of Pharmacy.*

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*Artificial Wood.*—MM. Barthe and Potin of Paris, have invented a new process for making artificial wood, by the aid of which products are obtained whose beauty is superior, and so like the natural substances as to deceive many. The many varieties of native woods which the inventors make are all composed of gelatine and sawdust, which are worked together and solidified by means of a peculiar process of tanning. This product being brought into a pasty mass can receive all kinds of stamp and variety of form. These stamped articles are on view in Paris, and the eye can scarcely distinguish them from fine specimens of carving in wood.—*Ibid.*

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*Effect of Intense Cold.*—The following account of an Arctic climate upon food is drawn from Dr. Kane's account of the Grinnell Exploring Expedition, lately published.

Such latitudes seem eminently adapted for experiments upon the condensation of gases. We should think that oxygen itself, after a few night's exposure with Dr. Kane, and then treated with solid carbonic acid and ether, would be found melting into tears, and suspect that this would be the legitimate use of a North-west passage:

"All our eatables became laughably consolidated, and after different fashions, requiring no small experience before we learned to manage the peculiarities of their changed condition. Thus, dried apples become one solid breccial mass of impacted angularities, a conglomerate of sliced chalcedony. Dried peaches the same. To get these out of the barrel, or the barrel out of them, was a matter impossible. We found, after many trials, that the shortest and best plan was to cut up both fruit and barrel by re-

peated blows, with a heavy axe, taking the lumps below to thaw. A crow-bar, with chiselled edge, extracted the *lamine* badly; but it was, perhaps, the best thing we could resort to.

Sugar formed a very funny compound. Take *q. s.* of cork raspings and incorporate therewith another *q. s.* of liquid gutta percha or caoutchouc, and allow to harden; this extemporaneous formula will give you the brown sugar of our winter cruise. Extract with the saw; nothing but the saw will suit. Butter and lard, less changed, require a heavy cold chisel and mallet. Their fracture is conchoidal, with hæmatitic (iron ore pimpled) surface. Flour undergoes little change, and molasses can, at  $-28$  deg., be half scooped, half cut, by a stiff iron ladle.

Pork and beef are rare specimens of Florentine mosaic, emulating the lost art of petrified visceral monstrosities seen at the medical schools of Bologna and Milan; crow-bar and handspike! for at  $-30$  deg. the axe can hardly chip it. A barrel sawed in half, and kept for two days in the Caboose house at  $+76$  deg., was still as refractory as flint a few inches below the surface. A similar bulk of lamp oil, denuded of the staves, stood like a yellow sand-stone roller for a gravel walk.

Ices for the desert come of course unbidden, in all imaginable and unimaginable variety. I have tried my inventive powers on some of them. A Roman punch, a good deal stronger than the strongest Roman ever tasted, forms readily at  $-20$  deg. Some sugared cranberries, with a little butter and scalding water, and you have an impromptu strawberry ice. Many a time at those funny little jams, that we call in Philadelphia "parties," where the lady-hostess glides with such nicely regulated indifference through the complex machinery she had brought together, I have thought I have noticed her stolen glance of anxiety at the cooing doves, whose icy bosoms were melting into one upon the supper-table before their time. We order these things better in the Arctic. Such is the "composition and fierce quality" of our ices, that they are brought in served on the shaft of a hickory broom; a transfixing rod, which we use as a stirrer first and a fork afterward. So hard is this terminating cylinder of ice that it might serve as a truncheon to knock down an ox. The only difficulty is in the processes that follow. It is the work of time and energy to impress it with the carving knife, and you must handle your spoon deftly, or it fastens to your tongue. One of our mess was tempted the other day by the crystal transparency of an icicle to break it in his mouth. One piece froze to his tongue, and two others to his lips, and each carried off the skin: the thermometer was at  $-28$  deg."

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*The behaviour of Fermentation and Putrefaction in Filtered Air.* By SCHRODER AND DUSCH.--According to the researches of Schwan, which have excited great attention, the microscopic germs of fermentation, fungi, and infusoria, are the agents which develop fermentation and putrefaction:

and consequently, if the air is heated to redness, which conveys these germs, the above phenomena cannot take place. The authors have filtered air through cotton wool, which air they have tested by allowing it to pass over substances which readily ferment or putrefy, and have arrived at the following conclusions:—1. That the filtered air will not putrefy flesh recently boiled with water. 2. That broth will remain many weeks unchanged in this air. 3. That the sweet wort from malt will remain unaltered for a week, and not undergo fermentation. On the contrary, the coagulation of milk goes on as rapidly in filtered air as in that which is not filtered. Flesh, which probably was not sufficiently heated before the experiment, putrefied in filtered air. The authors would draw also from their experiments the conclusions that there is a spontaneous decomposition, for which oxygen only is necessary, and which causes the putrefaction of flesh without water, and that of the caseine of milk, which converts the sugar of milk into lactic acid, but that the fermentation of malt wort, &c., does not belong to this category, as to effect this result some organic admixture of the air is necessary, which can be removed by a filtration or a red heat.—*Ann. of Pharm. from Annalen der Chemie.*

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*On forming vessels of gold by the aid of phosphorus.*—The property of phosphorus, of precipitating certain metals from their solution has long been known; and gold is among the number. M. Levot has used this process in forming gold vessels useful in chemical research. He takes the perchlorid of gold, and places in it, at the ordinary temperature, some phosphorus, moulded of a form convenient to serve as a nucleus for the vessel of gold. To give the phosphorus the desired shape, it is melted in a water-bath near 60°C. in temperature, within a vessel of glass having the form required. After cooling it, the phosphorus is taken out solid, from its envelop, breaking it, if it be necessary. The precipitation of the gold or the construction of the vessel is then begun; and it finally remains only to remove the phosphorus by re-melting it and washing by the aid of boiling nitric acid until the last traces are removed.—*Silliman's Journal.*

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*Gilding of Silk, &c.*—Commerce has furnished for some time a kind of silk treated by a galvanoplastic method; the threads produce a costly fabric of wonderful solidity. The author of the process is M. Pouilly. He first metallises the silk, then covers it with a thin layer of copper and finally applies the gold by the aid of the galvanic battery.—*Ibid.*

## Editorial Department.

AMERICAN PHARMACEUTICAL ASSOCIATION.—The following circular, issued by the Executive Committee of the Association, is reprinted here to give a wider circulation to the official invitation. The gentlemen to whom packages of the circulars have been sent in various places South, West, and North, will oblige the Committee by distributing them as *usefully* as possible. Before our next number the meeting will have taken place, and we hope to be able to give an account of its proceedings.

### CIRCULAR ADDRESS

*To the Pharmacutists and Druggists of the United States.*

By a resolution of the American Pharmaceutical Association in August last, the Executive Committee were directed to circulate an address to Apothecaries and Druggists throughout the United States. In pursuance of this duty, the Committee first present the official announcement of the meeting by the President, viz.:

#### AMERICAN PHARMACEUTICAL ASSOCIATION.

The Annual Meeting of the American Pharmaceutical Association will be holden in the City of Cincinnati on the last Tuesday [25th] of Ju'y next, at 11 o'clock, A. M.

The object of the Association being the advancement of Pharmacy in the United States, it is desirable that a general interest in its favor should be created among the Pharmacutists and Druggists. According to the requirement of the Constitution, the following conditions of membership are published, and an invitation is hereby extended to all who are eligible to membership, and who feel an interest in the Association, to attend the ensuing meeting.

Boston, May, 1854.

WM. A. BREWER, President.

*Extracts from the Constitution of the American Pharmaceutical Association.*

"SECT. II, Art 1.—All pharmacutists and druggists who shall have attained the age of twenty-one years, whose character, morally and professionally, is fair, and who, after duly considering the obligations of the Constitution and Code of Ethics of this Association, are willing to subscribe to them, shall be eligible for membership.

"SECT. II, Art. 2.—The members shall consist of delegates from regularly constituted Colleges of Pharmacy and Pharmaceutical Societies, who shall present properly authorised credentials, and of other reputable pharmacutists feeling an interest in the objects of the Association who may not be so delegated, the latter being required to present a certificate signed by a majority of the delegates from the places whence they come. If no such delegates are present at the Association, they may, on obtaining the certificates of any three members of the Association, be admitted, provided they be introduced by the Committee on Credentials.

"SECT. II, Art. 5.—Every local Pharmaceutical Association shall be entitled to five delegates."

The objects aimed at in the establishment of the Association are so full of interest to apothecaries and druggists, that every member of our profession is interested in its success. These objects are mainly *the improvement of the practice of Pharmacy*, and the elevation of the *professional character and qualifications* of its practitioners. To effect these desirable objects the Association has encouraged the measures adopted by government to prevent the importation of adulterated and inferior drugs; has advocated a spirit of self-improvement among existing apothecaries and druggists;



and has urged the adoption of efficient means of pharmaceutical education for the rising generation. By raising the standing and qualifications of the present race of pharmacutists, physicians will be much better served, the community at large benefited, and the apothecaries themselves will reap a greater pecuniary reward, inasmuch as their valuable services will command higher recompense.

The great subject of providing more efficient means of instruction by public institutions, and at home in the shop and laboratory, has claimed earnest attention, and was referred to a special committee last year, to report in July at Cincinnati. As the future progress of Pharmacy in this country will be materially affected by the systematic education of the present minors, it is of the first importance that those now in business should adopt a liberal spirit, and aim at making their pupils and assistants better apothecaries and druggists than themselves.

The Association looks towards the local organization of pharmacutists as a powerful means of effecting the reforms it aims at producing. Without co-operation nothing can be done; with it, every desirable reform may be carried out. Among the pharmaceutical ranks there is ample occasion for the display of brotherly feeling and charity—the best educated have room to improve;—the most meagerly instructed may raise their status greatly; and it wants but the infusion of more liberality of feeling, the silencing of the demon of jealousy, and a less bitter spirit of competition in business, to produce changes as useful to the members of our profession as they will prove salutary to the best interests of the community who are served.

It is with earnest sincerity, therefore, that we urge on our pharmaceutical brethren of the United States that they should openly recognise among their friends at home, the efforts making by the Association, and, when practicable, to attend its meetings and participate in its labors. The migratory character of the annual meetings affords an opportunity to a much larger number than would be the case if they were fixed at any centre; and in reference to the present meeting in the largest city of the Mississippi valley, the centre of a circle of human enterprize, we hope our western and south-western brethren will manifest a large share of interest, by making some sacrifices to attend its sessions.

The Corresponding Secretary, DR. WILLIAM B. CHAPMAN, corner of Sixth and Vine Sts., Cincinnati, will give information of the place of meeting.

WILLIAM PROCTER, JR., }  
 THOMAS B. MERRICK, } *Executive Committee.*  
 JOSEPH LAIDLEY, }

*Philadelphia, June 6th, 1854.*

ST. LOUIS MEDICAL SOCIETY vs. THE APOTHECARIES.—The following document issued by the St. Louis Medical Society, was sent to us by one of the parties addressed.

“At a regular meeting of the St. Louis Medical Society, held April 8th, 1854, the following Preamble and Resolutions, were adopted:

*Whereas*, Druggists in St. Louis, are in the habit of RE-FILLING prescriptions without any assurance that it is authorized by the physician prescribing; and, *whereas*, druggists are in the habit of prescribing for, and administering medicines to individuals who choose to consult them; therefore,

*Resolved*, That the apothecary has no just right to put up a prescription the SECOND time, unless authorised in writing by the physician prescribing.

Nor has said apothecary any right to make use of said prescription in any way, unless by the consent of the physician.

*Resolved*, That in case this Society can be positively assured of the violation of the foregoing resolution, we pledge ourselves to withhold our influence from any druggist who may thus act, and we will use other means to make such conduct public.

*Resolved*, That we withhold our support from all apothecaries who persist in the reprehensible practice of prescribing for diseases.

*Resolved*, That the Secretary of this Society, furnish every retail druggist in the city with a copy of these Resolutions "

The course adopted by the Medical Society to remedy the evils complained of, appears to have given umbrage to many of the apothecaries of St. Louis, and some of them, in their individual capacity, have availed themselves of the columns of the daily press to bring the matter before the public in a way not calculated to promote good feeling between physicians and apothecaries.

There are some points in the resolutions that deserve notice. In the first place, the Society, in issuing such a paper, should have appended the names of the officers, or given some attest of its genuineness, else it might be construed to be the work of some mischievous person.

The ground taken in the first resolution, "that the apothecary has no right to put up a prescription the second time unless authorised in writing by the prescriber," is not only not held out by the usual practice in England, whence most of our customs are derived, but we believe if such a law was promulgated by medical societies their own members would be among the first to break it, as it as convenient as usual for the physician to verbally direct the nurse or patient to have a prescription renewed. It has become the custom here among apothecaries to retain the original prescription, but in England it is quite common to return the original to the purchaser or patient enclosed in a stamped envelope. It is a part of medico-pharmaceutical ethics yet to be settled by general consent, how far the patient who pays for the prescription is entitled to it. Some physicians have assumed that the fee covers only the application, or the right to use the prescription at the time it is given; and such it would appear is the opinion of the St. Louis Medical Society. Others take a more liberal view and leave the matter entirely to the patient, trusting to the influence of good sense to regulate it.

There are cases where the undue renewal of a prescription should be avoided when known to the apothecary; as, for instance, where A. tells B. that certain medicine prescribed by Dr. C. for her child, certainly will cure B.'s child, on the mere supposition that the cases are similar; besides, it is an injustice to the family physician of B. who, if the child is too sick for legitimate domestic treatment, should be consulted.

The second resolution is not put forth in a spirit to do any good; it is too threatening in its character for a western city, where men of all classes are less controlled by custom and chartered privilege than in the older cities.

The practice of prescribing for diseases in general by apothecaries is certainly highly reprehensible, and deserves the rebuke of the third resolution when carried beyond the ordinary information regarding doses and minor complaints about which it is unusual to consult physicians. Prescribing is not the province of the pharmacist, and in doing it he is constantly liable to do mischief to the patient and injustice to the physician, who is not only thus deprived of his proper employment, but is too often called in after cases have become less curable by delay. Yet knowing the constant temptation to prescribe, owing to public importunity, especially from the lower classes, it is not surprising that much of it is done. We trust our brethren of St. Louis are not disposed to overstep the bounds of their profession, but are desirous of rendering efficient aid as co-laborers with the physician, and we should be sorry to see them by any ill advised measures of their medical friends do from a spirit of opposition what we believe is now done in a great measure from the force of circumstances.

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ST. LOUIS PHARMACEUTICAL ASSOCIATION.—It is with pleasure that we announce the organization of a pharmaceutical society in the city of St. Louis. By a letter from Mr. Alexander Leitch, we are informed that the pharmacutists of that city met on the 25th of May, 1854, and determined to form an association "for the purpose of exciting a more generous and brotherly feeling among the members of the profession of pharmacy," that they may co-operate in carrying out measures for the advancement of pharmacy and the improvement of the educational status of the apothecaries and druggists. The following gentleman were elected officers of the association, viz:

<i>President,</i>	. . . . .	J. E. Jones.
<i>Vice-Presidents,</i>	. . . . .	{ William L. Maddox.
		{ T. L. Rives.
<i>Treasurer,</i>	. . . . .	H. T. Platt
<i>Recording Secretary,</i>	. . . . .	H. G. Wade.
<i>Corresponding Secretary,</i>	. . . . .	Alexander Leitch.

We hope that five delegates from this new organization will be timely appointed, that they may be welcomed by the representatives of older societies at the Cincinnati meeting.

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"OLD PHYSIC AND YOUNG PHARMACY," or "A FEW WORDS WITH THE APOTHECARY."—The following remarks, under the above caption, in the May number of the New Jersey Medical Reporter, are from the pen of the associate Editor.

"The noise and show of quackery, in these days of patent Elixirs and Cure-alls, seem to have ensnared our friends of the mortar—and we have a few words for them. We hope they will take our counsel kindly, for though our prescription may be difficult to compound, and still more difficult to take, we feel assured that it is a good one. We do not pretend to assert that physicians themselves are just what they ought to be; but still we believe,

they generally observe a proper etiquette towards their brethren of Pharmacy. Let us examine our mutual relation for a few moments.

Apothecaries want to sell quack medicines. Doctors say it is a breach of fidelity, and an injury to society. Early in the history of medicine in this country, the Doctor's shop was the great central point, where medicine was prescribed, and procured. It was not the fashion then, to write prescriptions, but to prepare the medicine, and administer it to the patient; but as the sun broke out from its early dawn, and began to raise higher and higher, shedding light upon the advancing world of mind, the doctor began to think that there were two reasons why he should confer upon others the office of preparing medicine, and the advantages resulting from it. Chemistry whispered to him, in his musings, that she had been silently busy in the bowels of the earth, and in the waters of the great deep, and had discovered some wonderful things. He gave his assent, and bid her bring them out. She had a strong brother,—Pharmacy by name,—who came to his other ear, and whispered strange and very doubtful truths, about extracts, confections, and various novelties, before untold, and unknown. To this, Old Physic gave his nod of assent, 'evacuated the principalities' demanded of him, in a far more amiable mood than is exhibited by the Czar of Russia, and yielded the territory to the young conqueror quietly, both agreeing to aid each other, in the great work of healing. In good faith, both go on. Year rolls up against year; and as the steep of time becomes more and more rugged, they yet hold together, and in mature, vigorous manhood, are accomplishing more—far more, than they could have anticipated, when the *intervening* quack, without a crown of royalty to deck his brow, or a star of republicanism to enlighten his path, but with the iron step of a haughty usurper, comes in to sever the bond that had united the old man, with his adopted child. Now, what is the issue. The child, fired with the spirit of 'Young America'—instead of holding on in good faith, to good old custom, attaches himself to the train of the usurper, and begins to shout with the multitude that follow on in his dusty train. Quack medicines must be sold, and I will sell them. They must be sold, because they will be bought, and I will have the buyers. This is the logic—it is the logic of the day—and young Pharmacy dresses himself up in gold and glitter, shows himself at the corners of the streets, in significant characters, his pockets, 'drawers' and all, stored with the spoils of the aggressor, and offers them to the passing crowd.

He has left his first estate. He has become a caterer to a morbid moral taste,—a taste for the unreal. He must live,—this is the reason. He is not the author of the morbid desire for quackery. But, to accommodate the public, he will supply the demand created by it, as the jeweller supplies useless trifles, and trinkets, which are equally the creatures of an idle and corrupt taste. But where is Old Physic now? He is still in the line of his duty. He has kept to his contract. He does not sell even the medicine he has prescribed. Not because he cannot, but because he has said, *bona fide*, he would not. He sends his prescription to the apothecary, who furnishes the medicine "carefully compounded," and neatly put up, for a consideration. All right. Is there no reciprocal consideration, due the physician under these circumstances? Young Pharmacy opines not, if its return is in any way to interfere with money getting, not bearing in mind, that the physician has forfeited all claim to this end, by refusing to dispense the medicine himself. Pharmacy is the child of Physic. It is so in a two-fold sense. First by age, and second, by patronage. The business of prescribing belongs to the Parent, that of compounding, to the child.

A physician is in attendance upon a patient. He does not recover as rap-

idly as either party could desire. But such is the nature of the case. Perhaps it is phthisis, from which he cannot recover. He wants to try Jayne's, or Swain's, or somebody's expectorant. The doctor objects. The patient sends to the apothecary to know what is good for consumption. He is shown a bottle, on which is labelled, what the manufacturer, and vender, and consumer, all know to be a falsity—an infallible cure for an incurable malady. A dollar pays for it, and it is purchased. The patient is wronged out of his dollar, and the apothecary keeps his share, while the judgment of the physician is set at defiance. But all is forgotten when the poor sufferer dies, except the maxim, which it behooves all to remember—that the way of trade is, in many instances, the way of death. This is one difficulty. Here is another. Undue confidence is imparted to the manufacturer of quack medicine. Those who sell, indirectly sanction the whole system of quackery, and sustain a *patented* pharmacy, in opposition to their own recognized system. The physician is responsible for his prescription, it being certified by signature, and date. If it does harm, he is accountable. The apothecary, by selling a secret medicine, promising to cure, shares in the responsibility, if a cure is not effected.

Take for example, 'worm medicine.' It is a curious fact, that if a child is a little unwell, the careful mother, and knowing nurse, almost invariably diagnose worms. It picks its nose, loses its appetite perhaps; and a variety of other systems present themselves, till, (it being a simple case, not requiring the advice of a physician), the apothecary is consulted, and Hobensack, or Fahnestock, or some other representative of the school of patented pharmacy, is offered in the form of a vermifuge, which will eject the worms if there are any, either whole or in pieces, and if not, protect the system against them. The medicine is purchased, and administered. The bowels are actively purged, and violent disease is induced. Who is responsible? We will not answer. This is no picture. It is a *living fact*. We know that a large number of cases of sickness in children, to which the physician is called, particularly in the country, unless it be some sudden illness, have been previously treated by the family for worms; and we are satisfied from no very limited experience, that these 'worm medicines,' compounded by the covetous, patented by the ignorant, sold with promises, and used by the over-credulous, are often the cause of serious mischief. Such mischief, under the treatment of a physician, would subject him to a charge of mal-practice. But as it is done, by a counterfeiter, with the noise of 'sounding brass, and tinkling cymbal,' the perpetrator escapes unwhipt of justice.

We know right well, that should the profession of medicine return to the 'doctor shop' of olden time, our pharmaceutical brethren would feel like bringing their cantharides to bite at our wandering feet, and perhaps with justice. May we not say to them, that they perhaps need a gentle sedative, a cooling draught;—mixed it may be, with a moderate aperient, to carry off unwholesome deposits, that have already defiled the *body social*!

Take our prescription, and we think it will do you good. Your science is a noble one—and it is distinct. But so far as practical pharmacodynamic is concerned, leave it in the hands of the physician, and he will do you all the honor you may claim at his hands."

There is some good advice in "Old Physic's" remarks, and as it is given in a friendly spirit, we hope the brethren will profit by it; as regards "Old Physic's" opinion of his own profession, we have a few words to say, lest it should be thought that we consider it free from fault in the matter discussed. He takes the ground that "he does not sell even the medicine he has prescribed," but has handed it over to the apothecary, who

acts ungratefully toward him in not wholly abstaining from prescribing at the counter and from selling quackery. It would be well to call his attention to the fact, (Proc. Amer. Pharm. Assoc., 1853) that of 274 retail druggists in Philadelphia, 57, or one-fifth, are kept by practicing physicians, who, as they enter into competition with regular apothecaries, the latter, to compete, too often are induced to prescribe to retain their business. Add to this the immense amount of medicines dispensed by physicians in the rural districts, where apothecaries do not exist, and in villages and small towns where they do, and it must be admitted that "Old Physic," however kindly he may feel towards his offspring, has not yet become willing to trust him with the sole management and income of his pharmaceutical estate.

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IODIDE OF POTASSIUM AND THE MERCURIALS.—It is due to us to state that when the paper on the above subject, in our last number, was published, the author had entirely overlooked the extensive and important paper of M. Melsens, which, though written for a different object, included most of the results obtained by him.

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BRONZE LABELS FOR SHOP FURNITURE.—The Committee of the College of Pharmacy on Latin Labels have published the first edition of bronze labels, and a specimen of them may be seen in the advertising department of this number.

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*The relation between the atomic weights of the Chemical Elements.* By JOSIAH P. COOK, JR., Erving Professor of Chemistry in Harvard University. (From the Memoirs of the American Academy). Cambridge. 1854. pp. 22, quarto, with a chart.

We are indebted to Mr. Wm. A. Brewer, President of the American Pharmaceutical Association, for a copy of Mr. Cook's paper, of which the above is the title. The author appears to have given much thought to the subject and has developed some new views, but our space does not admit of entering upon an analysis of the paper for the benefit of our readers at this time.

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DEATH OF SIR JAMES WYLIE.—Many of our readers have heard of Sir James Wylie, of St. Petersburg, and chief physician to the Russian Court. A notice of him was published last year in Prof. G. B. Wood's introductory lecture at the University of Pennsylvania. Sir James Wylie was born in Scotland in 1768, was knighted at Ascot Heath Races in 1814 by George the Fourth, then Prince Regent; and subsequently, at the request of Alexander of Russia, was created a baronet of England, as he refused, though intending to reside in Russia, to give up his allegiance to the English crown.

DEATH OF M. ROUX. This eminent French surgeon died recently at Paris, aged 74. He was a cotemporary and early rival of Dupuytren.



THE  
AMERICAN JOURNAL OF PHARMACY.

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SEPTEMBER, 1854.  
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PROCEEDINGS OF THE AMERICAN PHARMACEUTICAL  
ASSOCIATION.

The American Pharmaceutical Association met at the hall of the Mechanics Institute, Cincinnati, July 25th, 1854, at 11 o'clock, A. M.

In the absence of William A. Brewer, President, the meeting was called to order by C. B. Guthrie, one of the Vice Presidents, and on motion, Edward S. Wayne, of Cincinnati, was appointed Secretary, *pro tem.*, in lieu of Edward Parrish, of Philadelphia, the Secretary, who was not present.

On motion, a Committee of the members of the Association was appointed by the Chair to examine Credentials, and that duty was assigned to W. B. Chapman, C. A. Smith, and Wm. Procter, Jr.

After a recess, this Committee reported the following list of delegates and gentlemen, as having been appointed by their respective Colleges, or as recommended for election according to the Constitution, viz:

By the *New York College of Pharmacy*.—George D. Coggeshall, Benjamin Canavan, Eugene Dupuy, Buckland W. Bull, and John Meakim.

By the *Massachusetts College of Pharmacy*.—William A. Brewer, S. M. Colcord, Joseph Burnett, Daniel Henchman, H. W. Lincoln.

By the *Philadelphia College of Pharmacy*.—Henry C. Blair, Charles Ellis, John H. Ecky, Charles Bullock, and C. H. Dingee.

By the *Cincinnati College of Pharmacy*.—W. J. Gordon, A. M. Stevens, Theodore Marsh, W. H. Coolidge, and Edward S. Wayne.

No communications relative to delegations from the Maryland College at Baltimore, or from the Richmond Association, were received.



The following members of the Association, not specially delegated, were recognized by the Committee, viz : C. B. Guthrie, of Memphis; William Procter, Jr., of Philadelphia; H. T. Cummings, of Portland, Maine; C. A. Smith, of Blue Licks, Kentucky; and Wm. B. Chapman, of Cincinnati.

The following gentlemen having been severally recommended by three members of the Association, were endorsed by the Committee as eligible for membership, and were duly elected, viz : Hamilton Creighton, of Xenia, Ohio; W. S. Merrell, W. C. Arons, and W. H. Addersley, of Cincinnati.

The roll was then called.

(It was a source of regret to the Association that so many of its members were absent; the causes assigned had reference chiefly to the prevalence of epidemic cholera in the Eastern cities, requiring the presence of pharmacutists at their posts, or to indisposition.)

On motion, a Committee was selected to nominate permanent officers for the Association, consisting of William Procter, Jr., W. H. Coolidge, C. A. Smith, H. T. Cummings, H. Creighton, and S. M. Colcord.

After a recess this Committee reported the following nominations :

For *President*.—WILLIAM B. CHAPMAN, of Cincinnati, Ohio.

For *Vice Presidents*.—HENRY T. CUMMINGS, of Portland, Maine; JOHN MEAKIM, of New York; JOSEPH LAIDLEY, of Richmond, Virginia.

For *Treasurer*.—SAMUEL M. COLCORD, of Boston.

For *Recording Secretary*.—EDWARD S. WAYNE, of Cincinnati.

For *Corresponding Secretary*.—WILLIAM PROCTER, JR., of Philadelphia.

For *Executive Committee*.—EDWARD PARRISH, of Philadelphia, Chairman; C. B. GUTHRIE, of Memphis; and A. M. STEVENS, of Cincinnati.

The report of the Committee was accepted, and on separate ballots the nominees were elected to the several offices for the ensuing year.

The President elect on being conducted to the Chair, returned his thanks to the Association for the honor conferred, and promised his best services.

The name of Lewis Reh fuss, of Cincinnati, was now brought forward by the Committee on Credentials, and he was duly elected a member.

The meeting then adjourned to 3 o'clock, P. M.

#### AFTERNOON SESSION.

The President took the Chair. The minutes of the Morning Session were read by the Secretary, and approved.

The report of the late Treasurer, Alfred B. Taylor, of Philadelphia, being in order, it was read and referred to A. M. Stevens and H. T. Cummings, to be audited.

The report of the Executive Committee for the past year was read by its chairman, W. Procter, Jr., and was accepted. This report informed that the Committee, immediately on the adjournment of the last meeting, collated, printed, and published 2000 copies of the "Proceedings," in the form of a covered pamphlet of 48 pages, at a cost of \$111, a part of which amount was defrayed by special contributions from the Philadelphia College of Pharmacy, and the Richmond Pharmaceutical Association.

The documents accompanying this report consisted of lists of druggists and apothecaries in the Southern and Middle States; and of contributions towards a list of non-official formulæ from Mr. A. J. Matthews, of Buffalo; H. T. Cummings, of Portland; and Mr. Meakim, of New York.

The report of Mr. Geyer, of Boston, on a proposed certificate of membership, being in order, was read by Mr. Colcord and laid on the table for future action. This report was accompanied by a draft of a certificate embracing a design emblematic of the art and science of Pharmacy, and a certificate stating that the American Pharmaceutical Association, having confidence in the ability and integrity of the holder, has elected him a member of its body.

The report of the Committee on Education (W. Procter, Jr., E. Parrish, D. Stewart and J. Meakim) being called for, it was read by the Chairman, and was accepted.

This report consisted, 1st, of a draft of an "address" to the Pharmacutists of the United States on the subject of education in the shop; 2d, a copy of the circular issued by the committee to gather information relative to the condition of education among

apothecaries ; 3d, of the answers to these circulars, tabulated for reference ; 4th, of the report on quack medicines, specially referred last year ; 5th, of a report on the expediency of endeavoring to obtain congressional action in reference to the mode of appointing drug inspectors ; and 6th, the report of G. L. Simmons, of California, on the condition of apprenticeship in that state.

On motion of C. B. Guthrie, the "address" was adopted by the Association, directed to be printed in the proceedings, and the Executive Committee were instructed to print such a number of copies, in a separate form, as in their judgment were necessary for general distribution.

## ADDRESS

### *To the Pharmacutists of the United States.*

The American Pharmaceutical Association, deeply impressed with the importance of adopting some measure by which the present and future apothecaries of this country may be improved in educational standing, viewed in reference to the practice of their profession, have determined to address their brethren everywhere in our widely extended country, believing that some good results may arise from the hints they will suggest.

By an inquiry extended to all sections of the Union, it has been ascertained that a vital defect exists in the very budding process of pharmaceutical education—the apprenticeship. In all the pharmaceutical institutions of Europe, where degrees are granted to apothecaries, the preliminary service in the shop is a *sine qua non* to admission to the examinations, it being generally four years, and in many of them the attendance on lectures follows this term of practical initiation into the duties of the shop and laboratory. In England, where as yet no degree-granting institution exists among pharmacutists, the apprenticeship system is carried out by indenture as in ordinary usage, so important is this preliminary training conceived to be to the education of a pharmaceutical chemist. In many stores in the Atlantic cities north of Virginia, and more especially in Philadelphia, a system of apprenticing exists, yet it rarely happens that a lad is legally indentured ; the idea of such an instrument being exceedingly repulsive to most boys who aim at the apothecary business. In lieu of a legal indenture a feeling of honor-bound obligation should exist, equally binding on the part of apprentice and employer, capable of retaining the connection until the obligation is cancelled by termination of service and completion of education. For want of this tie between learners and employers, our country has been deluged with incompetent drug clerks, whose claim to the important position they hold or apply for is based on a year or two's service in the shop, perhaps under circumstances illy calculated to increase their knowledge. These clerks in turn become principals, and have the direction of others—alas ! for the progeny that some of them bring forth, as ignorance multiplied by ignorance will produce neither knowledge nor skill.

When we investigate the causes of this state of things, it will be found to arise primarily in the want of a correct feeling of the dignity and responsibility of the calling of the apothecary as a branch of the medical profession. The larger number of those who deal in drugs and medicines do it solely to make money ; they aim at making the most out of the least outlay of capital or trouble ; to *sell* medicines is their vocation ; and he is the best clerk who can sell the *most*, under whatever circumstances it is effected. To avoid the necessity of gaining the

requisite knowledge of practical pharmacy, it is no uncommon habit to buy their preparations ready made, except the simpler ones, and at the lowest price, and the business, thus *shorn* of its most interesting department, the application of chemistry to the conversion of crude drugs into medicines, becomes a mere store keeping, where the drug clerk is kept putting up and selling parcels and bottles of medicines, the preparation of which, and the beautiful reactions often concerned in their manufacture, he is as complete a stranger to as though they did not exist. Is it any wonder then that, after one or two years service, the apprentice should fancy that he had learned the business as a *seller* of drugs and chemicals, and becoming uneasy at the prospect of a four years term, breaks the slender connection that binds him to his employer and starts out as a fledged clerk! In these days of manufacturing pharmacutists, when most of the nicer preparations, from Dover's powder to fluid extracts, are to be bought ready made, the temptation to purchase them is great, even to the qualified principal, who thus saves himself the responsibility and trouble attending their manufacture; but he is apt to forget the injustice thus done to his *protégés*, who are thus deprived of the important practical knowledge only to be gained by becoming familiar with the manipulations they involve. Having abandoned, to a large extent, the making of these preparations, such apothecaries are ready but too often to accept the agency of the numerous quackeries that abound to swell their sales, and from this are led into the origination of secret compounds and become quacks themselves. Further, they are induced to trench on the business of the tobacconist, and the variety storekeeper, by keeping their wares; and sometimes to a considerable amount.

So long as this abandonment of the legitimate duties of the pharmacist is permitted, it is hopeless to expect apprentices will feel that interest in the business they have embarked in that is excited when they are called upon to carry out the various chemical and pharmaceutical processes that properly belong to every well conducted apothecary's shop.

Familiarity with these processes, in which the phenomena of mechanical division, solution, extraction, distillation and other operations are practically studied, is the true basis upon which to build the knowledge required by a skilful extemporaneous pharmacist, or prescriptionist, whose vocation includes the highest department of the art of an apothecary. It is indeed the only basis upon which it should repose. *Making* the officinal preparations is therefore an indispensable part of pharmaceutical education, and no apothecary, whose scheme of business does not include at least a considerable portion of them, can efficiently educate those under his care.

It may be said that the preparation of the strictly pharmaceutical compounds by the manufacturer of character more surely supplies the dispenser with medicines of unexceptionable quality. This is only partially true, because the institution of such a branch of business by the qualified, soon calls into its scope unqualified and careless men, who look at profit and not at therapeutic power in the purchase and treatment of drugs. Besides, the temptation to expand their business is a strong inducement, even to the skilful, to make quantities of fugitive and easily decomposable compounds, which are forced on distant markets, where they are to be dispensed, and where, too often, the dispenser deals them out in full assurance of their excellence. The gradual effect of this custom on the dispenser is to render him tributary to the druggist and manufacturing pharmacist for many preparations, the efficiency of which he is bound, by the highest calls of duty, to be personally assured of.

Before leaving this part of the subject we would urge a careful consideration of these hints by those of the brethren to whom they apply, that they may see whether their duty to themselves, to their apprentices and assistants, and to the medical profession does not require them to prepare all the officinal medicines that their shops will admit of (that are prone to deterioration, or are difficult to test.) In this category certain of the extracts and of other classes of preparations are not included, where the use of steam or a vacuum pan, or some other peculiarity of the process may be required, not at the command of the apothecary. There are many chemicals that can be easily made in the smallest apothecary

shop, from materials it must necessarily possess, and which will interest the apprentice, yet the safe guard which analysis offers to the apothecary, in protecting his stock of chemicals from adulteration, renders it less important to include these within the scope of his laboratory.

The correspondence with apothecaries before alluded to, has placed the Association in possession of many facts bearing on the condition of pharmacy and pharmaceutical education within the United States. It appears that the tenure of apprenticeship resting on the simple agreement of the parties apprenticed has become so lax, especially in the western States, that as a general rule very little dependence is placed upon it. Boys are taken at a venture by the year, the employer making the best bargain he can, feeling assured that the boy will leave or demand clerk's wages before he has been with him half a regular term. From this cause, it is stated, the number of half educated assistants is quite large, and presents a serious difficulty in the prosecution of business in the way it should be conducted. As the result of this condition of things it has been found that there are three classes of individuals engaged in pharmaceutical pursuits who claim the interest of the Association, and to whom more particularly this address is directed, viz.: *First*, those who are imperfectly acquainted with pharmacy and are in business for themselves; *secondly*, those who have been but half educated as apprentices and who are now assistants receiving salaries, having the responsibility of business entrusted to them; and *thirdly*, those who are now apprentices or beginners under circumstances and with ideas unfavorable to the acquirement of a thorough knowledge of the drug and apothecary business. Of course all those instances, which happily are not a few, where individual ambition or natural talent for study or business has triumphed over the difficulties alluded to, are not included.

In thus addressing the individuals composing these three classes, the Association disclaims all disposition to arrogate to themselves *as a body* any superior claim to knowledge or skill. They have associated together to improve themselves, and to adopt measures to improve the profession of pharmacy at large. They know that these classes of individuals *exist*; they feel that a remedy is loudly called for, which, whatever it may be, can only be rendered efficacious by the consent and co-operation of the parties interested. It is therefore earnestly hoped that this address will be received in the kindly spirit in which it is offered, and its suggestions examined and weighed by all who may feel themselves to belong to the classes addressed.

After a young man has commenced business he rarely feels disposed, or thinks he has time for systematic study, and is apt to discard all attempts at it, depending on the occasional references to books rendered necessary by the absolute demands of business. This is a mistake. There is sufficient time if it is rightly applied. Let the young proprietor who feels his deficiency, make it a rule before making each preparation, as required, to read carefully the commentary in the Dispensatory, and afterwards note the correspondence or difference of his results with those laid down. This will cause him to detect errors, if they exist, or to correct his own, will soon give a useful habit of observation of great practical value, and will gradually excite an interest in the collateral branches of science, chemistry and botany, that, if pursued, will place him on the high road to professional competency. The young proprietor should adopt at first an honorable scheme of conducting business; he should determine to sell *good* drugs and medicines, come what will, and in doing so he will have a right to the best prices whether he gets them or not. He should cultivate a good feeling toward the medical practitioners of his neighborhood, should study the interest of the latter so far as the efficiency of medicines is concerned, and physicians will soon, from interest, incline towards him. He will aid his success by storing his memory with general information useful to his patrons, and render himself as necessary to the comfort as he is to the health of his neighborhood by his willingness to give it out.

These remarks apply to the dispenser of medicines rather than to one doing a mixed or wholesale business; on the former mainly depends the progress of pharmacy, and remembering his own imperfect opportunities, he should give to his ap-

pernices or subordinates the best tuition he is capable of. It is a mistaken and short-sighted policy in the apothecary to withhold instruction beyond the mere calls of business, under the impression that it will react unfavorably to his interest. The man who has efficient assistants will have his reputation increased instead of diminished, and this will be a safeguard against ingratitude, when it occurs.

To this end he should improve and extend his pharmaceutical library by annual additions; he should encourage the periodical literature of Pharmacy, to keep posted up with the improvements and discoveries of the day, and he should exhibit such an interest in his apprentices or assistants as will encourage them to adopt studious habits, which is the best safeguard against the temptations into which young men and boys are drawn, unless they have some regular object of pursuit.

The *second class*, or assistants but half educated, are a numerous and interesting portion of the pharmaceutical community. They are found every where, because the causes of their deficiencies exist every where, though not equally so. To induce these to do *now* what they should have done in their minority is the object of this appeal. The assistant, except in those instances where the pressure of business is continuous during business hours, has ample opportunities for study. He should not fail to embrace them on every occasion, whilst his mind is untrammelled by the troubles and responsibilities of the engagements peculiar to the proprietor. He should beware of the idea that he "knows enough to conduct business." In offering himself as a pharmaceutical assistant, a young man tacitly declares that he is capable of conducting a dispensing establishment; that he is a fit adjunct to the physician in combatting disease. He assumes a responsible position, next only to that of his employer. In the eye of the law he *is* responsible, in the absence of his employer, for the conduct of business, and is actionable for the results of ignorance or carelessness. A proper sense of this should induce the assistant to qualify himself by study; to read regularly and understandingly, and assist his reading when necessary by experiment and observation. He should never let a false pride induce him to pass over an error uncorrected, and he should always keep in view that his destiny is to be a proprietor, and act as becomes a pharmacist. By pursuing these suggestions many third or fourth rate assistants might command the best situations and good salaries.

The *third class*—the beginners or apprentices—call forth the earnest sympathy of the Association. It depends much on the employer and his chief assistant whether the apprentice will make rapid or slow progress, or whether he will ever make a good apothecary; it very much also rests with himself. Some dispositions are so inimical to tuition that no amount of pains will fashion them into shape; yet it often happens that a promising youth will grow into irregularities from the want of a little candid training on the part of the employer. If there is any one fault in American boys more prominent than another, it is the inclination to act independently of authority. The "young America" spirit leads to various ill results, one of the chief of which is imperfect education, whether professional, mercantile or mechanical. It is one phase of this ill spirit that is now filling the ranks of pharmacy with half educated clerks. Let the young apothecary do *well* what he attempts, and carry it out on all occasions, from the most menial service of the shop to the most accurate operation of the laboratory. Let him vie with his fellows in the graceful handling of the spatula and the pestle, in the neatness of folding a powder or bundle, in the accuracy of writing or attaching a label, and in the quick, quiet and courteous mode of conducting business at the counter; these are all parts of the accomplishment of a perfect pharmacist. The beginner should early adopt the idea that his vocation consists of something besides a business for gaining a livelihood; it also partakes of the character of a liberal profession, and demands of its votaries that they uphold its ethics even at the sacrifice of gain, that they sell good medicines even if they get low prices, because it is wrong to dispense bad medicines when it is possible to get good. It would be well if every beginner could have a vision of the duties he has to perform before entering the precincts of the shop as an apprentice.



The picture would discourage all but the earnest ones who, seeing beyond present inconveniences and annoyances, aim at the highest qualification. To these the apothecary's store, with all its petty details and trials, its busy days and tedious evenings, affords a field rich in the produce it yields to the unremitting exertions of the earnest student; as with Scheele and Davy so with many an one in our day. World-renowned celebrity will cling to names unsuspected of greatness, the early efforts of whose possessors are now confined to the narrow limits of the shop.

It is a misfortune to many that an idea of the lucrativeness of the apothecary business has long since obtained popular credence; and often the fond parent, anxious that his boy should be started on the road to fortune, has unwittingly doomed him to an unhappy companionship with the pestle and mortar, when in the counting room of the merchant or the workshop of the machinist he might have attained to their desires.

The numerous instances of individuals in other callings who have commenced as apothecaries, bear ample testimony to the truth of this statement, and are a speaking caution to all concerned, that the fitness of boys for pharmaceutical pursuits should be ascertained before placing them with apothecaries.

The difficulties in the way of sustaining schools of pharmacy will here, as in Europe, confine them to large cities, where the number of students and the accessories to study are numerous. Slow but regular currents will circulate between these and distant towns, and their Graduates, in seeking spheres of action, will carry back with them the principles they imbibe, and thus act as examples to their less favored brethren, altogether advantageous to the public weal. The vast importance, therefore, of good schools of pharmacy, where the sciences pertaining to our art are regularly taught, is so evident, that this Association freely extends its countenance and encouragement to those already existing, and to all new efforts, claiming for them the patronage they deserve.

Such are some of the more prominent points at issue in the educational reform so greatly needed in the pharmaceutical body of the United States. If the incubus of quackery was removed, a general feeling of the necessity of better means of pharmaceutical education excited, and a strong chain of associations, linked together by fraternal feeling, established, the prospects of American Pharmacy would be flattering indeed. The most sanguine believers in progress do not expect a sudden reformation; but there are many who look with strong faith and much interest to the silent influence of a better education in working a change among the individuals of the profession, and it is the earnest hope of this Association that the hints now offered in this address will not be lost, but that many a brother, in his distant unpretending scene of action, will be induced to raise his standing and usefulness by personal exertions, and become a light to his brethren and a boon to his neighborhood.

The fifth document accompanying the report, relative to the expediency of seeking Congressional action in reference to the appointment of drug examiners, was read and accepted. The committee observe that "in view of the partizan character of political appointments, and the little dependence that can be placed on the judgment of the appointing power in cases like the one under consideration, it will be inexpedient to make any application to Congress until such time as the drug law itself may require a general change or reënactment, when a clause might be inserted making it *obligatory* on the Secretary of the Treasury to appoint fully qualified pharmacutists," in lieu of



abstract chemists, country physicians, and others, who are unfitted for the post.

The report on "The Circular of Instructions to the Special Examiners of Drugs, etc." issued by Mr. Guthrie, Secretary of the Treasury, referred to the committee on "Standards for the Inspection of Drugs," was now read and accepted.

The Report of the committee on "A system of Standards for the government of the Special Examiners of Drugs," etc., referred to Messrs. Procter and Coggeshall, was now read by the Chairman of the Committee, was accepted, and laid on the table for future action.

A communication from Gustavus L. Simmons, of Sacramento, California, corresponding member of the Association was now read, accepted, and laid on the table.

The Report on the subject of "Home Adulterations" being called for, C. B. Guthrie, Chairman, stated that the committee had not been unmindful of the task assigned them, that in proceeding in their labors the subject had so increased in magnitude and importance that they did not feel ready to report this year, and thought that by the time of the next annual meeting they would be able to produce a report that would surprise the members of the Association. The Committee was continued, and encouraged to proceed.

The consideration of the report on Statistics was postponed until to-morrow at the request of the Committee.

The Report on Quack Medicines, was now called for, read, and accepted. This Report, after advising, that no direct action should be taken by the Association, suggests in view of the strong popular feeling in favor of these medicines :

"1st. That this desire for medicine can be gratified in a legitimate way by regular officinal preparations.

"2d. That it is the duty as well as interest of the apothecaries and druggists to advocate the use of the Officinal medicines in lieu of the quackery of the day.

"3d. That it is the rightful interest of regular pharmacutists to divert, in this manner, the thousands which now annually flow into the coffers of quacks, into their own limited stores, where of right it belongs.

"4th. That this can only be done by a united and sustained action on the part of the pharmacutists and druggists of the Union, by which they will practically refrain from the sale or advocacy of secret medicines, and substitute regular officinal compounds for them correctly labelled, with name and directions for use.

"5th. That this course should receive the sanction of physicians as the only one likely to remedy the evil aimed at, as the tendency to take medicine *ad lib*.

*itum* is a feature of the Anglo Saxon race, duly inherited by the American people, which, whatever may be its faults, is as much their nature as is the love of political and personal freedom.

“With regard to the propriety and efficacy of legislative action, we think that movements in that direction should originate in the several States, and be the joint action of the medical and pharmaceutical professions, and when applications are made to Legislatures they should be based on a real interest on the part of druggists and apothecaries generally to abate the evil, and not on a partial or very local movement.”

The association then adjourned to 8 o'clock P. M.

#### EVENING SESSION.

At the appointed time the President called the meeting to order, and the afternoon minutes were read and adopted.

On motion, the Report on the Certificate of Membership was taken up for consideration. Some discussion ensued. The draft submitted by the Committee was objected to as not meeting the wants of the Association. The design of the artist was objected to as not being appropriate; and the suggested wording of the certificate was considered as being far too positive, making the instrument equal to a diploma, as it certified to the moral as well as professional character and qualifications of the holder.

Mr. Colcord observed that, unfortunately, none of the Committee were present, and he was unable to state their views.

On motion of C. A. Smith the whole matter was laid on the table until next year, and the Committee continued.

On motion of C. B. Guthrie the report of the committee on Standards was directed to be printed in the proceedings. The importance of the subject was dwelt upon and it was resolved to continue the committee (Messrs. Procter and Coggeshall,) and increase it at the suggestion of its chairman, by the addition of Charles T. Carney of Lowell Massachusetts, and Edward S Wayne of Cincinnati.

The consideration of Mr. Simmons' report on the state of Pharmacy in California was now resumed, and the Executive Committee were directed to print it in the Proceedings.

[We glean from this Report, that California, with a population, permanent and floating, of 400,000 souls, has 77 regular druggists, of which San Francisco has 30, Sacramento 19, Mary'sville 5, Stockton 4, Placerville 3, Nevada 2, Coloma 2, Sonora 2, Diamond Springs 2, and eight smaller towns each one.

Throughout the mining settlements most of the storekeepers keep an assortment of drugs and patent medicines.

“Mr. Simmons observes,” I am happy to record that some of the evils complained of in my last report are being remedied. This is more especially true of San Francisco, Sacramento, Mary'sville and Stockton, where a great change

in the habits of druggists, apothecaries and physicians has occurred. The members of each of these occupations appear to better understand their mutual relations, and in a majority of cases, we find them adhering to their legitimate business. Most of the physicians who started in either branch of the drug business, have found it impossible to go on smoothly and profitably with both professions; and those druggists and apothecaries who were addicted to the practice of prescribing at the counter, have found it to their interest to abandon the habit, observing that the well educated physicians were adopting the system of separating the two departments of prescribing and compounding medicines."

Mr. Simmons further remarks on the increased attention to convenience and elegance in the pharmaceutical stores, and considers that a large proportion of them will compare favorably with those of the Atlantic States, and more attention is given to the qualifications of employees. Indeed, one of the San Francisco stores is arranged in the most costly and elegant manner. The dispensing spatulas are of gold and silver, attached to the store is a fine laboratory and a *suite* of rooms apportioned into library, sitting and consulting apartments, for the special benefit of medical gentlemen, forming a kind of Exchange where Physicians may interchange their views, consult the best or latest authorities, or otherwise spend their time. The entire building is supplied with gas, and an Artesian well in the rear furnishes an abundance of water.

The excessive cost of advertising has proved a difficulty in the way of introducing new quackery, and it is only the older varieties, known at home to the people, that are much sought."—EDITOR.]

On motion, it was resolved, that the unofficinal formulæ communicated by Messrs. Mathews of Buffalo, Cummings of Maine, and Meakim of New York, be preserved by the Secretary, with a view to publication should future similar contributions accumulate sufficiently to justify it.

After the reading of a letter from the New York delegation to the late President, giving the reasons for their inability to be present, the meeting adjourned to 8 o'clock to-morrow morning.

JULY 26th,—8 o'clock, A. M.—The Association met and accepted an invitation from the Cincinnati College of Pharmacy to visit their Cabinet, located in the Museum rooms of the Miami Medical College. The Collection of East India drugs and other specimens is quite numerous. A valuable series of the Cinchona barks of Peru and Columbia is embraced in it; the whole including chemical and botanical items, numbering more than eight hundred specimens, neatly enclosed in bottles and boxes, and labelled.

Before returning to the Hall, the members were gratified in visiting the new steam fire apparatus belonging to the city of Cincinnati, and the invention of one of her citizens.

At half past 10 o'clock, A. M., the President took the Chair, and the minutes of the previous meeting were read and adopted. Dr. Guthrie, as Chairman of the Committee "on the Collection and Arrangement of the Statistics of Pharmacy in the United States," read a sub-report by Joseph Laidley of Richmond, on

the state of Pharmacy in the Southern, Atlantic and Gulf States, accompanied by tables containing much valuable information, which will prove very serviceable to future inquirers. The sub-report of Dr. Cummings, on the state of Pharmacy in the New England States, was also read, detailing many deficiencies in the practice of Pharmacy of that section, and attributing a portion of them to the illiberal course adopted by some physicians.

Dr. Guthrie continued the report for the Western States verbally, excused the physicians of that region from any unfriendliness to pharmacutists, but gave ample evidence to the necessity of pushing measures of pharmaceutical reform in those States.

The Committee on Credentials brought forward the names of J. V. Whetstone and J. W. Hannaford of Cincinnati, and W. R. Smith of Hillsborough, Ohio, who were duly elected members and signed the Constitution.

The report of the late Corresponding Secretary was read and accepted.

On motion of Dr. Guthrie, it was resolved that this Association recommend to the several Colleges of Pharmacy and Pharmaceutical Associations, the appointment of Committees of Correspondence from their own bodies, who shall address the apothecaries of their respective sections upon the objects of this Association, for the promotion of its designs.

The report of the Committee on prizes was now read by its Chairman, C. A. Smith, in which it is recommended, that in view of the limited finances of the Association, but two prizes be offered for the ensuing year. To make the award more honorable to the recipients, it was determined to make them in books rather than in money. The two following resolutions offered by the Committee were then adopted.

*Resolved*, That a copy of twenty-three volumes of the American Journal of Pharmacy be (and hereby is) offered for the best essay which shall develop the commercial history of all drugs indigenous to the United States, as senega, spigelia, serpentaria, etc., as regards the manner and places of their collection and preparation for the supply of commerce, the amount annually collected, and the channels through which they enter general commerce.

*Resolved*, That a copy of the inorganic portion of Gmelin's

Handbook of Chemistry, (as published by the Cavendish Society in six volumes,) is offered for the best essay on the question, "Do Hyoseyamus, Belladonna and Conium, grown in the United States, contain their active principles in the same proportions as the European grown plants."

To carry out the object of the resolutions in an efficient and impartial manner, it was

*Resolved*, That all essays (in answer to the above resolutions,) be referred to a special committee of judges, who will report on their relative merit to the next annual meeting of the Association, this committee to consist of Daniel B. Smith of Philadelphia, Dr. David Stewart of Baltimore and John Meakim of New York.

*Resolved*, That if, in the opinion of the judges, none of the essays received are worthy of the prizes, that they decline awarding them in their report; the contributors may then either withdraw their essays or leave them in possession of the Association.

*Resolved*, That all essays contributed for the prizes be delivered, free of charge to Daniel B. Smith of Philadelphia, on or before the second Tuesday of August, 1855, in order to give time for their examination.

On motion of C. A. Smith, it was Resolved that when this Association adjourns, it adjourns to meet in the city of New York, on the second Tuesday in September, 1855, (at 3 o'clock, P. M.)

The President having announced that the members of the Association were invited by Mr. Lewis Rehfuß to visit his vineyard this afternoon, the invitation was accepted.

On motion of Dr. Guthrie, the names of A. J. Mathews of Buffalo, and E. S. Wayne of Cincinnati were added to the committee on "Home Adulterations."

The President announced the reception of a copy of an essay on "the Relation between the Atomic Weights of the Chemical Elements, by Josiah P. Cooke, Jr." from Wm. A. Brewer, late President of the Association. When, on motion, the meeting adjourned to 2 o'clock this afternoon.

#### AFTERNOON SESSION.

The President called to order about the time agreed to, and the Secretary read the minutes.

On motion of C. A. Smith, it was Resolved that a committee of three be appointed to draft a law regulating the sale of poisons, to be submitted to the Association at their next annual meeting, and if approved, to be presented to the Legislatures of the several States for their adoption.

The Chair appointed Alfred B. Taylor, of Philadelphia; Joseph Laidley, of Richmond; and Theodore Marsh, of Cincinnati, to this service.

On motion of C. A. Smith, it was Resolved that a Committee of three be appointed to inquire whether any and what amendments are required by the law regulating the importation of drugs and medicines, to render it more efficient, uniform, and advantageous to the public at large.

The Chair appointed C. B. Guthrie, of Memphis; G. D. Coggeshall, L. W. Haskell, of New York; and A. M. Stevens, of Cincinnati, to this duty.

The following preamble and resolution, offered by William Procter, Jr., were adopted:

This Association having learned with great interest that in the culture of the grape in the neighborhood of Cincinnati, attention has been turned to the production of wines and tartar, and that the success which has thus far attended this branch of industry leads to the belief that in a few years the crop of each will be extensive, it is therefore Resolved, in view of the importance of these articles in medicine, that a Committee of three be appointed to inquire into the adaptation of these wines for medicinal purposes, and the probable amount and quality of the tartar likely to be produced annually.

The Chair committed this inquiry to Lewis Rehfuss, of Cincinnati; C. A. Smith, of Blue Licks, Ky.; and C. B. Guthrie, of Memphis.

On motion of the same gentleman it was

*Resolved*, Inasmuch as the Constitution of this Association was adopted at a time when the wants of this body were not so well known as at present, that the whole matter of its revision be referred to a suitable Committee, to report such amendments as they may deem best to the next annual meeting.

To this important duty Edward Parrish, of Philadelphia;



George D. Coggeshall, of New York ; and Samuel M. Colcord, of Boston, were appointed.

It was further Resolved, that the attention of the pharmacutists of the United States be directed to the idea of universally adopting a single name to indicate the business of the apothecary, and that the subject be revived at the next annual meeting with a view to officially adopting it if approved.

On motion of S. M. Colcord the following resolutions were adopted.

*Resolved*, That those members of the Association who are strangers in Cincinnati, express their warmest gratitude for the kindness and attention they have received from the Cincinnati College of Pharmacy.

*Resolved*, That the thanks of the Association are tendered to the President and Secretary for the able manner in which they have discharged their duties.

*Resolved*, That we appreciate the efforts of the Cincinnati College of Pharmacy to improve the standing and qualifications of the drug dealers of the West, and that we recommend them to extend their sphere of action to meet those of other pharmaceutical societies, until such time as new organizations are made within their sphere.

The Association now adjourned to accept the invitation of Mr. Reh fuss to his hospitable mansion, situate a few miles west of Cincinnati, agreeing to meet on their return for final adjournment.

[Mr. R., one of the most skillful apothecaries of Cincinnati, is about relinquishing his business, and devoting his attention wholly to the grape culture and its consequents. Being a practical chemist he has given much attention to the composition of soils in connection with the growth of both American and European grapes, of which last he has about 90 varieties under culture. It is well known to the chemical physiologist, that a large quantity of potassa is annually abstracted from the soil in which grapes are grown, to constitute the base of the bitartrate of potassa found in their juices. A deficiency of this alkali has a marked influence on the wine produced, as when in sufficient proportion so large an amount of acid is removed as to render the wine dryer and more mellow and agreeable, whilst when deficient, the free acid, not being precipitated from the forming wine, like the potassa salt, it is retained and gives it acerbity. Mr. Reh fuss has experimented successfully by using wood ashes as a manure, and his guests were gratified in comparing wines of the same grape and year, the one produced from ashes manured soil, and the other from the same soil without that addition; the former being more bland and mellow than the latter, though equally spirituous. The hilly character of the country around Cincinnati appears to adapt it admirably for the vineyard, and much soil, for this reason, ill-suited to agricultural purposes, has been rendered available and valu-



able. The grape crop of the present year will be much influenced by the late spring frosts; and a species of mildew, probably the oidium, has made in some vineyards extensive inroads on the grapes after they have attained half their growth. Mr. Reh fuss finds the application of a dilute solution of sulphuret of potassium to stop the progress of this blight when timely applied. From the results of his experiments he anticipates much success in the production of tartar, and in the manufacture of pure brandy. After duly availing themselves of the elegant hospitality of their hostess, and not forgetting the Pure Catawba of their host, the Association returned to the Hall highly gratified with their visit.—EDITOR.]

#### EVENING SESSION, 8 O'CLOCK, P. M.

After the organization of the meeting and the reading of the previous minutes, Dr. Guthrie offered the following Resolution, which was unanimously adopted.

*Resolved*, That the thanks of this Association are due and are hereby tendered to Mr. Lewis Reh fuss for the many interesting and valuable facts furnished in connection with the culture of the grape, and for his generous hospitality.

John Scott, of Cincinnati, having been recommended and endorsed by the Credential Committee, he was duly elected, and signed the Constitution.

There being no further business, the Secretary read the general minutes, which, after amendments, were adopted as a whole, and the Association adjourned.

#### ON NITRATE OF IRON.

BY THOMAS LANCASTER.

(An Inaugural Essay.)

Within a few years considerable importance has become attached to nitrate of iron as a remedial agent in chronic diarrhœa. Its effectiveness as a local styptic, with its genial tonic influence, seems fully to answer the indications, even in the most obdurate forms of that insidious disease. The chameleon appearances of the article supplied by the apothecaries of Philadelphia as solution of nitrate of iron suggests that there is something wrong in the officinal formula.

One supplies a fluid containing besides nitrate of iron considerable quantities of magnetic oxide; another supplies a solution of ter-nitrate with variable proportions of proto-nitrate; all varying at different times in the quantities of iron. Nowhere have I

found the true ter-nitrate of sesquioxide which probably is the result desired in the officinal prescription.

Theoretically, each fluid ounce of the solution of nitrate of iron of the Pharmacopœia should contain 32 grains of the salt  $\text{Fe}_2\text{O}_3, 3\text{NO}_3$ , but with the greatest caution, when the true ter-nitrate is formed, it seldom reaches two-thirds of that amount. When  $2\frac{1}{4}$  ounces of nitric acid sp. gr. 1.42 are saturated with moist hydrated sesquioxide of iron, and diluted to thirty fluid ounces, there will be formed a true and beautiful reddish solution of ter-nitrate of sesquioxide of the proper strength to answer the requirements of the Pharmacopœia. The solution thus made keeps without change a considerable time, and remarkably well under the protection of sugar when converted into a syrup. A syrup of sufficient density will be formed by pouring the acid solution of iron upon two pounds of sugar, and adding sufficient water to make the whole measure thirty fluid ounces. Either of the above would be admissible dispensed for solution of nitrate of iron.

Syrup of proto-nitrate of iron  $\text{FeO NO}_3$  has become a favorite with many practitioners in this city, who assert that its effects are more energetic, that its larger equivalent of iron, its greater stypticity, render it better suited to the worst types of the disease in which it has become so frequently the only resort. The method by which I have succeeded in preparing a syrup of proto-nitrate of iron is the following: Nitrate of lime is first formed, and the solution decomposed by its proper equivalent of proto-sulphate of iron; thus, two fluid ounces of nitric acid sp. gr. 1.42 may be saturated with carbonate of lime and filtered, washing the filter with sufficient water to make the solution measure three fluid ounces. In ten fluid ounces of water dissolve 1485 grains of well crystallised proto-sulphate of iron, then filter; if requisite, the two solutions are to be mixed in a beaker glass, and poured immediately upon a filter of muslin stretched across one end of a glass percolator, and the filtrate allowed to fall upon two pounds of sugar, sufficient water being added to make the syrup formed measure thirty fluid ounces. The sugar may be dissolved without the aid of heat, a beautiful emerald green syrup is the result which is not liable to decompose, and contains 32 grains  $\text{Fe, O, NO}_3$  to each ounce.

## PREPARATION OF THE SALTS OF NICKEL.

By JOHN BROUGHTON.

*(An Inaugural Essay.)*

Not finding in the records of pharmaceutical chemistry, any instructions for the preparation of Nickel and its salts as remedial agents, it may be well to notice the appearance it presents in a commercial state, and the methods of preparing and purifying its salts for use.

The principal ores from which Nickel is obtained, are those containing cobalt in conjunction with arsenic, copper, sulphur and sometimes iron. In the metallic state, Nickel is sold in small cubical blocks, and is made by reducing the oxide with charcoal in a strong fire. In the form of sulphuret it is a dull black heavy powder, or, semifused, a dark brown porous mass.

But the general form in which Nickel finds its way into commerce, is in that of an arseniuret called speiss, a bye-product remaining at the bottom of the crucible in the preparation of cobalt.

From either of these sources it may be obtained pure, but most readily from the fused speiss.

The powdered speiss is fused with a portion of alkaline glass, to which a small portion of nitre has been added, when the cobalt separates as a vitreous scoria, and the arseniurets of nickel, &c., are found fused into a lump at the bottom of the crucible; the lump is then powdered and roasted to expel arsenious acid, when the metals are left behind as basic arseniates.

These are fused with carbonate of soda containing a little nitre, the arsenic acid unites with the soda forming a soluble arseniate, while the metals are left in the state of oxides.

The arseniates and excess of carbonate of soda are then washed away with water, and the oxides dissolved in dilute sulphuric acid. The solution is then boiled with a small portion of powdered chalk, which precipitates the iron as carbonate, leaving the nickel untouched, while the sulphate of lime formed is itself insoluble.

If the solution contains copper, (which may be known by immersing into it a clean slip of iron, and noticing whether it is coated with metallic copper on withdrawal,) it is to be precipi-

tated by a stream of sulphuretted hydrogen, the solution filtered to separate the sulphuret of copper, and gently boiled to expel hydro-sulphuric acid. The solution of the sulphate may then be set aside to crystallize by spontaneous evaporation, or the carbonate or oxide immediately precipitated by an alkali or alkaline carbonate; caustic ammonia, or its carbonate, are not suitable, as an excess dissolves the precipitate.

The oxide may then be dried with a gentle heat, which, if increased, will expel water of hydration and leave anhydrous oxide.

If an attempt be made to accelerate the crystallization of the sulphate by concentrating the solution by heat, a change occurs similar to that of the corresponding salt of manganese, (viz.) the formation of an insoluble subsulphate of a greenish white color, into which the sulphate will change entirely by continued ebullition; more or less of the subsalt is formed during the spontaneous crystallization of the neutral subsulphate. It adheres slightly to the crystals, but may be washed away by agitation with a little water. Metallic nickel is readily oxidated by nitric acid with the production of a nitrate. The solution of the nitrate gradually changes by exposure to the air more quickly at an elevated temperature, and an insoluble gelatinous sub-nitrate is formed, more difficult to separate from the neutral salt than the corresponding subsulphate.

But it is objectionable to form a nitrate from the metal, on account of the difficulty in separating iron, if it should be present, which not being thrown down by sulphuretted hydrogen, cannot be precipitated as in the sulphate by carbonate of lime, without the production of a nitrate of lime more difficult to dispose of than the iron salt.

A better plan is to oxidize the metal by mixing it in powder, with two parts of nitre and one of carbonate of potash, then fusing them together in a crucible at a red heat, until nitrous acid fumes cease to be given off. The mass, when cold, is powdered and washed to separate the potash and any arsenical compounds, and the oxides dissolved in dilute sulphuric acid, treated with carbonate of lime to separate the iron, with sulphuretted hydrogen to precipitate copper, and then either precipitate the nickel, or crystallize by spontaneous evaporation. From the precipitated oxide all the salts of Nickel may be obtained.†

## OLEUM CHENOPODII ANTHELMINTICI, OR WORMSEED OIL.

BY SAMUEL S. GARRIGUES.

*(Being part of an Inaugural Essay presented to the University of Gottingen.)*

This oil is obtained from the seeds of the *Chenopodium Anthelminticum*, Linn., a plant found in the middle and southern parts of the United States.

*Description of the plant.*

Gen. *Chenopodium*, L. Flowers perfect, all bractless. Calyx 5 parted, not appendaged or becoming succulent, more or less enveloping the depressed fruit. Stamens 5. Styles 2. Seed horizontal lenticular; embryo coiled into a ring perfectly encircling the mealy albumen. Smooth weeds, usually more or less covered with a white mealiness; the leaves petioled, triangular or rhombic, thooted or entire.

Flowers sessile in small clusters collected in spiked panicles. (Name from  $\chi\eta\nu$ , a goose, and  $\pi\acute{o}\delta$ , a foot, in allusion to the shape of the leaves.)

C. *Anthelminticum*, L. Plant pale green. Root perennial. Stem 2 to 3 or 4 feet high, angular, grooved, branched; leaves ovate-oblong, narrowed at the base into a petiole, coarsely and unequally cut-toothed or sinuate; sprinkled with resinous dots beneath. Flowers in long slender, interrupted, naked racemes or spikes; cluster small. Calyx smoothish, green. Stamens longer than the calyx. Styles 3, united at the base. This species of *Chenopodium* is found in nearly all parts of the Southern United States, and is known in common life under the name Wormseed. It is found growing around dwellings, roadsides and in cultivated soils, &c. It flowers in July, and the seeds become ripe towards autumn.

The entire plant has a strong unpleasant aromatic odor that is not wholly lost by drying. The seeds are smooth, rounded on the margin, very light, and of a dirty yellow or brown color. Their taste is bitter aromatic, and possesses in the highest degree the peculiar odor of the plant. On separating the outer covering by rubbing, a thin shining corn shows itself, which is filled with the volatile oil.

This plant has been used for a long time by the Indians as a

vermifuge, and from them it has been introduced into the present pharmacopœia of the United States. The manner of application as first obtained from the Indians, was to give the expressed juice of the plant, alone or with milk. At the present time the seeds and oil are mostly used to destroy the ascariden.

According to Engelhardt, thirteen ounces of the seeds gave three and a half drachms of volatile oil of a light yellow color, which by long standing became gradually brown and quite thick.

Shortly after its preparation it had a specific gravity of 0.909, and oil which had stood two years gave a S. G. of 0.960. Two kinds of oil are found in the American market, one under the name Baltimore and the other called western wormseed oil. Each is sold at a quite different price, though no difference can be found in their appearance or effects. The cheapness of the western oil may be accounted for from the greater abundance of this particular plant, as well as from the probable mixture with it, in the distillation, of other plants belonging to the same species.

The oil which I used in my examination had in the crude state a brownish yellow color, was specifically lighter than water, and had a strong aromatic odor; its boiling point was  $190^{\circ}$  Cen., and it had a specific gravity at  $16^{\circ}$  Cen. of 0.959.

It is soluble in large quantities in alcohol and ether.

Oil of wormseed absorbs large quantities of chlorine, attended with a considerable elevation of heat and the liberation of hydrochloric acid gas. If the process is continued for some time the entire portion receives a dark red color. This, when distilled with an excess of carbonate of lime, gave a colorless liquid having the odor of camphor, and burning with a smoky flame tinged with green.

The analogy of this liquid, with the similar compound of chlorine with oil of turpentine, rendered it hardly necessary to continue the investigations.

No explosion was obtained on the addition of iodine. Added in excess it gave the oil a dark red color, with separation of a resinous substance.

Caustic potash formed no combination with this oil, but a resinous mass was left after distillation from the same.

In the analysis of this oil the following method was adopted.

A portion of the oil was distilled with water ; the product of the distillation was collected in ten different portions, according to the different periods of the process. The first two, or those portions obtained in the earlier periods of the process, were distilled in the same manner as before. The first products of this re-distillation were collected and freed from the water, by mixing and digesting them for several days with fresh prepared chloride of calcium. As obtained by this process, this oil was perfectly colorless, burned with a strong smoky flame, and had a specific gravity by 16° Cent. of 0.932. Its boiling point was found to be near 176° Cent.

A few pieces of potassium, still slightly tarnished upon being dropped into the oil, assumed the clear metallic lustre of the pure metal. A portion of this oil was now for the third time distilled in the presence of potassium, the product being used for the elementary analysis. The result of this is as follows :

Quantity of material taken = 0.369 gramme gave

Water . . . . . 0.386

Carbonic acid . . . . 1.192

Hence the pro cent. composition

Carbon . .	88.073	20	88.24
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Hydrogen .	11.758	16	11.76
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#### *Action of hydrochloric acid gas.*

A stream of hydrochloric acid gas was passed through a quantity of the oil obtained by the above method, the effect of which was to change it gradually to a dark red color, attended with a considerable degree of heat, and the separation of a dark colored resin. The excess of acid was now neutralized with fresh burnt carbonate of magnesia and the whole distilled with water. The distillate was of a light yellow color, burning with a smoky flame having the edges tinged with green.

This product was again submitted to the action of dry hydrochloric acid gas, till at last nearly the entire quantity changed into a light red colored crystalline mass. This was then dried by pressing between blotting paper and redissolved in alcohol, from which it crystallized on cooling in white prisms, having the odor of common camphor and an aromatic taste.

This was obtained pure by sublimation. It is insoluble in



water, soluble in three parts alcohol and ether, from which it is obtained in crystals.

From all appearances this product is similar to that obtained by the action of hydrochloric acid gas on oil of turpentine.

In preparing the crystalline combination of hydrochloric acid gas, with wormseed oil, the part which still remained liquid was mixed with water and allowed to stand for some days. On examining it at the end of this time, quite a number of crystals were found. These, on being decomposed by sulphuric acid, gave the peculiar odor of hyacinth, a fact which seems to hint at a strong analogy between this composition and that compound of turpentine oil and water mentioned by Deville and others, which gives the same peculiar reaction.

In order to examine the products of the latter periods of the first and original distillation, the last two portions collected at this period were also redistilled, and the product of redistillation freed from water, by digesting with fresh prepared chloride of calcium, as above. As obtained by this process, the oil had a yellowish brown color, a specific gravity by 16° Cent. of = 0.987 and a boiling point at 245° Cent.

The analysis of this oil gave the following results:

Quantity of material = 0.488 gramme gave

Water . . . . . 0.462

Carbonic acid . . . . 1.401

Hence the pro cent.

Carbon . . . . . 78.278

Hydrogen . . . . . 10.450

Oxygen . . . . . 11.272

This analysis gives the formula  $C^{20} H^{16} O^3$ , or

				Langerfeld *	
Carbon	. . .	120	78.948	78.05	80.07
Hydrogen	. .	16	10.526	10.54	10.41
Oxygen	. . .	16	10.526	11.41	9.52

\* It must be mentioned, that Mr. Langerfeld had commenced in the Göttingen laboratory an examination of the oil of wormseed. Owing to circumstances the investigations were not finished; his analyses were kindly presented to me by Prof. Wöhler, and correspond to some extent with my results.

From the various examinations which have been undertaken with this oil, it seems that it is composed of two different oils, one containing oxygen and the other not. The first belongs in the group of oils composed of carbon and hydrogen in the atomic relations of 5 to 8, which group, in combination with hydrochloric acid gas, forms both solid and liquid compounds, of which turpentine oil is the type.

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ON THE CHANGES TO WHICH LIQUOR FERRI IODIDI IS SUBJECT,  
AND ITS RESTORATION.

By J. M. MAISCH.

With many apothecaries it is customary to cover their bottles and vials containing the solution of iodide of iron with dark colored paper, to protect it from the action of light, whilst many others do not deem it necessary at all. The practice of covering these bottles arises from the supposition that the light has a decided effect on the combination of this solution, by gradually setting iodine free and depositing sesquioxide of iron. In my own experience I have found the liquor in small bottles, well stopped and not quite full, keeping for months unprotected from the diffused daylight without any perceptible change of color; and on the other hand, I have noticed it changing to a dark orange red in larger bottles, carefully covered with dark paper, which had to be opened occasionally to dispense their contents according to prescriptions. The U. S. Pharmacopœia directs it to be "closely stopped," and the U. S. Dispensatory does not mention any thing about the action of light.

Referring to the American Journal of Pharmacy, I find in vol. xiv. page 59, an article by Dr. A. T. Thomson, which, after speaking of the consistency of his "thick" syrup, has the following: "It is unnecessary to preserve the syrup in stopped bottles, or to seclude it from light," and "this syrup, well prepared, undergoes no decomposition when it is exposed to the air or the light." Messrs. T. and H. Smith, in the Pharm. Jour., (Am. Journ. of Pharm., 1847, 102) direct it to be kept "in small vials carefully corked, and covered with dark colored paper." W. Tozier (Am. Jour. of Pharm., 1853, 58) speaks of a *syrup* of iodide of iron, which in 8 fl. ounces, contains 7 oz. of sugar, as

keeping admirably well for a considerable period, especially when protected from the air and light and in a cool situation.

These contradictory remarks have induced me to make some experiments on the subject, the results of which I will give in this paper.

The liquor ferri iodidi which I used was prepared according to the formula of the U. S. Pharmacopœia, omitting, however, the application of heat, the union of the iron and iodine being effected in a flask by constant rotation. The liquor was free of iodine, not a trace of it was shown by starch. The experiments I divide into four parts.

PART I.—*The vials filled and well corked to exclude the air from the liquid.*

a. A vial was placed in the diffused daylight, care being taken to seclude it from the direct and even reflected sunlight. It was unchanged after the lapse of three weeks.

b. A vial was exposed to the direct sun rays. The liquid, although at first of the required pale greenish color, soon became lighter, and after a week was of a beautiful clearness and lightness, bleached until it was nearly colorless.

PART II.—*The air freely admitted to the liquid, the vials being half-full and covered with gauze.*

c. A vial was exposed to the sun. The liquid soon assumed a reddish tinge, and after two weeks, had altogether the appearance of a solution of iodine.

d. A vial was placed in common day-light. The solution, though more slowly, underwent the same change.

e. A vial was put in a dark place, carefully protected from the light. A week afterwards it had assumed a light reddish brown color, not so deep, however, as d. after the same period.

PART. III.—*Action of light on the colored liquor ferri iodidi in carefully corked vials.*

f. The vial from experiment c. was filled up with the original liquid, and exposed to the sun-light.

g. Vial d. without being filled up, was placed as before. The solution in both vials soon became lighter, and at last of the same brightness as vial b.

*h.* Vial *e.* was excluded from the light by being wrapped in dark colored paper, and thus set in the sun-light. Four weeks exposure in this way did not produce any perceptible change of color.

*i.* The same vial was wrapped in thin white unsized paper, and placed in the same position. Gradually, though very slowly, it was decolorized.

#### PART IV.—*Action of light and air.*

*k.* Vials *g.* and *i.* were uncorked, fresh air blown in and immediately well corked, and put back in the sun-light. At first, the liquid was slightly colored on the surface; the color descending down to about the middle of the liquor, it gradually became colorless again; the change progressing upwards.

The vials, whose contents have been decolorized, do not contain the slightest precipitate, and the liquor is of neutral reaction, has the taste of a fresh prepared article, but is of a brighter appearance; although experiment *k.* has been repeated four times with two of the vials. It is evident that the iron, which had been separated by the interference of oxygen, was taken up again in solution. How this recombination takes place, in what way the oxygen is separated from the sesquioxide of iron, I cannot tell at present; other experiments which I intend to make, may probably throw some light on this subject.

From the above experiments, I arrive at the following conclusions:

1. That no decomposition of the solution of iodide of iron, (U. S. P.) takes place by the action of light, (Part I.)

2. That this decomposition and oxidation is attributable only to the presence of oxygen; but

3. That the oxidation takes place in a much shorter time, the more the liquid is exposed to the action of light, (Part II.)

4. That on the contrary, the direct sun-light possesses the power of restoring the original color and composition in air-tight vessels, bleaching it almost to the disappearance of all color, (Part III.)

5. That the heat of the sun alone can not perform this change, (experiment *h.*) although it may promote it.

6. That the sun-light changes it the faster, the freer it is allowed to act on it, (experiment *f. g.* and *i.*

The practical results of these experiments for apothecaries are two-fold: 1, to be able to have always a nice preparation on hand, and 2, to restore the solution when changed by exposure to its former qualities; and, therefore, it is unnecessary to prepare, as it was proposed, a thicker syrup, the sugar of which was to prevent the separation of iodine and iron; the present solution is too convenient on account of its capability of being dropped, to make such a change desirable, since every body can preserve it in the most simple manner.

*Philadelphia, July, 1854.*

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ON THE PRODUCTION OF WINE BRANDY, AND TARTAR IN  
THE VALLEY OF THE OHIO.

BY THE EDITOR.

During a recent visit to Cincinnati, we had several opportunities of inquiring into the progress of the grape culture in that neighborhood, and were gratified at the very considerable progress that has been made in that branch of industry. The hillsides around the city are thickly spotted with vineyards, and the culture of the vine is spreading from farm to farm; the excess of produce, beyond the demand of the table, finding a ready market at the wine presses of the large growers and wine makers. The difficulties and discouragements incident to all new enterprises are being gradually overcome, the kinds of grape best adapted to the soil and climate have been ascertained, and the wine growers now look forward to an annual increase of their crops.

Many foreign varieties of the grape have been experimented with, and several of native origin, but none has proved as well suited to the production of wine, as the native *Catawba*. Major Adlum, of Georgetown, D. C., has the credit of being the first to bring the *Catawba* into notice as a wine grape; and, "in view of its present and prospective importance as the yet unrivalled wine grape, for a native superior to which Mr. Longworth has offered a reward of five hundred dollars, he has declared that in bringing this grape into public notice, he has rendered his country a greater service than he would have done, had he paid off the national debt."

Mr. Longworth of Cincinnati, the pioneer in this enterprise,

has been experimenting for thirty years on the foreign grape, both for table and for wine, and has imported vines from Paris, Bordeaux, the Jura Mountains, and from Madeira, but all failed; Mr. Longworth's experiments were first made at the vineyard, well known under the name of Baldface, now about twenty-eight years old. Since Longworth's pioneer enterprize, the Cincinnati Horticultural Society and the American Wine-growers' Association have fostered the grape culture, and have repeatedly awarded prizes to successful competitors.

In 1846, there were 83 vineyards in the neighborhood of Cincinnati, containing 248 acres under cultivation, and 114 acres bearing, and 24,000 gallons of wine were made. In 1852, 1200 acres were in culture, and 750 bearing, and the yield was calculated to be 500,000 gallons. That portion of this wine crop, called the sparkling (or champagne) Catawba, alone was worth \$175,000.

A bushel of grapes will yield from three to three and a half gallons of juice. Mr. Buchanan commenced planting his vineyard in 1843; in 1850, he realized, besides the cuttings, 1640 gallons of wine. In 1853, he obtained from five acres 4236 gallons, or 847 gallons per acre. In particular spots, there has been obtained 800 gallons from an acre, but 650 gallons is considered a large yield.

The demand for Catawba wine is far ahead of the supply, and the quality is constantly being improved, both by the cultivators and by those who prepare it for market.

The Wine-growers' Association, of which Mr. Lewis Rehfuß is the President, hold their meetings monthly, alternately at the vineyards of the members.

The last of these meetings was held in July, on the grounds of Mr. Werk, in Green Township, four miles from Cincinnati, where the vineyards of Mr. W. cover fifty acres, one-fifth of which is planted with the Catawba grape. On this occasion, thirty varieties of native wines were examined by the members; but, as usual, the prevailing opinion was in favor of the "sparkling Catawba," for which Mr. Werk's is noted. The wine vaults of this gentleman are equal to many of the champagne establishments of France. The deep arched cellars are ninety-eight feet by twenty-seven feet, and contain about 65,000 bottles of wine, with all the conveniences for bottling.



We had the pleasure of visiting the wine cellar of Messrs. Longworth and Zimmerman, of a similar character. The main apartment was an immense stone arched vault, twenty feet deep, and, perhaps, twenty-five by one hundred in area, on either side of which was arranged a series of wine vats or casks, each of which, we were told, held near 3000 gallons; besides these there were a number of smaller dimensions, the whole probably containing near 100,000 gallons. Opening into this, was the wine cellar for storing bottled wine, large stacks of which were piled horizontally along the sides, to improve by age. The temperature of this vault is about 66°, and we were informed, is about two degrees warmer in mid-winter than in mid-summer; a temperature highly favorable to the slow fermentation necessary to the maturation of the wines.

We also examined some pure Catawba brandy, made by Messrs. L. & Z., which possessed, in a high degree, the true aroma and flavor of distilled wine.

In looking at this new enterprise, in a pharmaceutical point of view, there are several features of great interest. The item of cream of tartar alone has become so important in medicine and the arts from the numerous products derived from it, or uses to which it is applied, that the scarcity of the salt from the repeated failure of the grape crop in Europe, has very materially influenced the prices of its derivative products.

It is well known that pure brandy in this country is not *always* to be found, and when met with, commands so elevated a price, that it is rarely employed as a menstruum when appropriate. These two items alone, render the wine growing enterprise extremely interesting to American pharmacutists, apart from the ameliorating influence, which the substitution of pure native wines for crude distilled liquors will probably have in promoting the cause of rational temperance. Mr. Reh fuss has already prepared tartar of excellent quality from his own wine vats, and there can be but little doubt from the data now ascertained, that a few years will enable the wine makers of the West to supply almost wholly the domestic demand for this valuable salt.

Mr. R., as we have already noticed at page 399, has turned his attention to the application of chemistry to the grape culture, and finds that manuring with wood ashes, in some soils, greatly



improves the resulting wine, by increasing the deposit of tartar at the expense of the acid of the grape.

As brandy is frequently made from weak wines, which retain much of the tartar, the residue of the brandy still is another source of cream of tartar, which will be rendered available. From Mr. Rehfuß's experiments, he believes that grape juice will yield *one* per cent. of tartar. This gentleman has been made Chairman of a Committee to report on the subject of the production of wines and tartar, to the next annual meeting of the American Pharmaceutical Association, and we may anticipate an interesting account of the whole matter from his able pen.

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### ON CAPRYLIC ALCOHOL AND ITS DERIVATIVES.

By J. BOUIS.

Caprylic alcohol,  $C^{16}H^{32}O^2$ , is a transparent, colorless, oleaginous liquid, producing stains upon paper like the essential oils; it is insoluble in water, but soluble in ordinary alcohol, in wood-spirit, ether and acetic acid; it readily dissolves fatty substances, resins, sulphur, phosphorus and iodine. It burns with a fine white flame, and has no action upon the plane of polarization; its density is 0.823 at 63° F.; it boils at 354° F., without decomposition, under a pressure of 0.760<sup>mm</sup>.

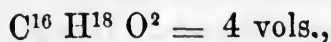
Sulphuric acid converts it into sulphocaprylic acid, which is capable of combining with bases, or into a fluid carburet of hydrogen isomeric with olefiant gas, amylene, &c. This carburet is also produced by fused chloride of zinc.

Caprylic alcohol is attacked by potassium and sodium, furnishing compounds in which a portion of the hydrogen is replaced by the metal. Chloride of calcium combines with it, furnishing well-defined crystals; this compound is more soluble in the cold than by heat, and is decomposed by water.

Castor-oil, when suitably treated by potash, always furnishes one-fourth of its weight of sebacic acid and one-fourth of its volume of perfectly colorless alcohol; the residue consists of a mixture of fatty acids, one fluid, resembling oleic acid, the other solid, and presenting the composition of ethalic acid. The alcohol, when purified by repeated distillation from fragments of

potash, may be distilled completely without acquiring any color, and without any variation in its boiling-point.

Numerous analyses, performed with products obtained from American, French and German oils, agreed exactly with the formula



which is also confirmed by several determinations of the density of the vapor. Identical results were obtained with the alcohol produced by treating pure ricinolic acid with potash.

*Caprylene*,  $\text{C}^{16} \text{H}^{16}$ , is a colorless refractive fluid, with a rather strong odor, which is insoluble in water, but soluble in alcohol and ether; it burns with a very luminous flame; its density is 0.723 at 63° F.; under a pressure of 0.760<sup>mm</sup>, it boils at 247° F., without undergoing decomposition; the density of its vapor by calculation is 3.86 = 4 vols.; the average of several experiments was 3.86.

This hydrocarbon was obtained by distilling the alcohol either with sulphuric acid or with fused chloride of zinc. The action of ordinary sulphuric acid furnishes, according to the duration of the contact, either sulphocaprylic acid,  $2\text{SO}^3$ ,  $\text{C}^{16} \text{H}^{17} \text{O}$ , HO, or a mixture of caprylene and sulphuric ether, or finally a hydrocarbon isomeric with caprylene, but possessing very different properties; its density is 0.814; it boils at about 482° F., and its boiling-point rises rapidly, its odor then becoming unbearable, resembling that of perspiration.

*Sulphocaprylic acid* is a colorless syrupous fluid, which is readily soluble in water and alcohol; when heated it becomes black, and is decomposed; its solution, when boiled, reproduces caprylic alcohol. It is obtained by decomposing sulphocaprylate of baryta by dilute sulphuric acid, or sulphocaprylate of lead by sulphuretted hydrogen, and evaporating the fluid *in vacuo*.

Sulphocaprylate of baryta is of a pearly-white color, fatty, very soluble in water and alcohol, from which it is sometimes deposited in the form of acicular crystals; it is decomposed about 212° F., or by remaining too long *in vacuo*. When pressed between paper, its analysis gave numbers agreeing exactly with the formula  $2\text{SO}^3$ ,  $\text{C}^{16} \text{H}^{17} \text{O}$ ,  $\text{Ba}^2 \text{O} + 3\text{HO}$ . It is excessively bitter, but leaves a very sweet after-taste. It serves for the formation of the other sulphocaprylates.

Sulphocaprylate of potash is white and pearly, and undergoes no change in the air; it is very soluble in water and alcohol; when heated it begins to fuse, and burns, without carbonization, with a very brilliant flame. It may be obtained by double decomposition by means of the baryta salt, or directly by saturating the acid with carbonate of potash. It is decomposed when heated above  $212^{\circ}$  F. Its constitution is  $2\text{SO}^3$ ,  $\text{C}^{16} \text{H}^{17} \text{O}$ ,  $\text{KO}$ ,  $\text{HO}$ . Analysis:—

	Found.		Calculated.
$\text{SO}^3$ , $\text{KO}$	34.1	33.9	33.9
Carbon	37.1	37.17	37.3
Hydrogen	6.92	6.93	6.9

*Capryloacetic ether*,  $\text{C}^{16} \text{H}^{17} \text{O}$ ,  $\text{C}^4 \text{H}^3 \text{O}^3$ , is a liquid of a very agreeable odor, insoluble in water, and boiling at  $374^{\circ}$  F. It may be readily obtained by means of caprylic alcohol and acetic acid, with a current of muriatic acid gas, or better still by acetate of soda and sulphuric acid. The numbers obtained lead to the formula above given.

*Caprylomuriatic ether* is a liquid, insoluble in water and but slightly soluble in alcohol; its solution is not precipitated by silver salts; it burns with a smoky flame, which is green towards the edges. It possesses a very distinct odor of orange. Its boiling-point is about  $347^{\circ}$  F. It is prepared either directly by means of muriatic acid, or by perchloride of phosphorus. Its analysis agrees very well with the formula  $\text{C}^{16} \text{H}^{17} \text{Cl}$ .

*Caprylohydriodic ether*,  $\text{C}^{16} \text{H}^{17} \text{I}$ , has much analogy with the preceding. During its preparation a large quantity of red phosphorus was obtained.

By the action of sodium upon the muriatic ether, all the chlorine is removed, and the product of the action is either *capryle*,  $\left\{ \begin{smallmatrix} \text{C}^{16} \text{H}^{17} \\ \text{C}^{16} \text{H}^{17} \end{smallmatrix} \right\}$ , or *caprylene*,  $\text{C}^{16} \text{H}^{16}$ , according as the operation has been effected by cold or heat. In the cold, sodium becomes covered with a white pellicle of chloride of sodium, which is detached by moving, and then replaced by a fresh coat, as long as the fluid retains any chlorine. Analysis:—

	Found.		Calculated.
Carbon	85.04	16	84.95
Hydrogen	14.99	17	15.04

When the action of the sodium was assisted by heat, until it was no longer attacked, a liquid possessing the odor and density of caprylene, and boiling like it at  $255^{\circ}$  F., was obtained. Its composition is  $C^{16} H^{16} = 4$  vols. Analysis gave:—

	Found.		Calculated.
Carbon	85.59	16	85.71
Hydrogen	14.40	16	14.29

The density of its vapor was  $3.80 = 4$  vols. Calculation requires 3.86.—*London Chem. Gaz. from Comptes Rendus*, May 22d, 1854, p. 935.

### ON THE PURITY OF ALCOHOL.

By EDWARD N. KENT.

In a recent investigation which required the use of alcohol perfectly free from fusel oil, I was led to suspect that nitrate of silver could not be depended upon as a test for this substance, and upon mixing pure fusel oil with pure alcohol, verified my suspicion. Nitrate of silver is not reduced by fusel oil, even by boiling, but it is true that alcohol frequently contains other organic substances by which nitrate of silver is reduced when mixed with it and exposed to heat and light. Most of these substances can be removed by simple distillation, but fusel oil cannot be removed in this manner, and consequently this substance constitutes the most usual and injurious impurity in all commercial alcohol. To detect its presence I find that pure sulphuric acid is the best and most convenient test, and as I am not aware that this acid has before been used for this purpose, I will proceed to describe the method of using it as a test for fusel oil.

It is well known that when concentrated sulphuric acid is mixed with fusel oil that a dark purple mixture is produced, with the formation of sulpho-amylic acid. This fact forms the basis of a new test for fusel oil. When pure sulphuric acid is added slowly to pure alcohol, the mixture remains perfectly colorless; but if it be added to alcohol containing the least trace of fusel oil, the mixture becomes colored in proportion to the amount of impurity.

The most convenient method of applying this test is to fill a small test tube to one-half its capacity with the spirit to be tested; the tube is then to be filled with pure concentrated sul-

phuric acid, which must be added very slowly, otherwise the heat produced will cause the spirit to boil and project the acid violently from the tube. If the spirit is impure, the mixture will immediately become colored, and if but slightly so, it is best to examine it by looking down through the open end of the tube. The color, if any, becomes deeper on standing some hours, but generally a few minutes will suffice to determine as to the purity of the spirit under consideration.

I have tried the above test on spirits of different strength, from absolute alcohol to proof spirit, and find that the water in the latter does not perceptibly affect the test, when the quantity of sulphuric acid used is equal to that of the spirit to which it is added.—*New York Journal of Pharmacy*, Aug. 1854.

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#### ON THE PREPARATION OF FUMING NITRIC ACID.

By Prof. C. BRUNNER.

A mixture of 100 parts of crystallized nitrate of potash and 5 parts of flowers of sulphur is put into a retort, and 100 parts of English sulphuric acid are poured over it. With large quantities, the best plan is to add the acid in fractions, as the mixture becomes considerably heated. It is now distilled with a gentle heat into a well-cooled receiver, when a fuming acid of a strong red color passes over from the commencement. After a time the sulphur separates from the mixture, and floats on the fluid with a pure yellow color. From this time little more fuming nitric acid passes over, its place being taken by the ordinary acid. It is, therefore, advisable to change the receiver. If about 50 parts of the above-mentioned mixture have gone over, this is about the right proportion.

The acid thus obtained is very strongly fuming, and of a red color. It contains a considerable portion of sulphuric acid, as may be shown by its reaction with chloride of barium. If it be again distilled by itself with a gentle heat in a retort furnished with a long tube attached, without luting, to the neck of the retort, a very strongly fuming acid, quite free from sulphuric acid, passes over; this separates into two strata, of which the upper is the fluid substance which was regarded by Berzelius as nitrate of oxide of nitrogen, by others as hyponitrous acid, but which is

universally considered to be the fuming principle of the ordinary fuming nitric acid. It is remarkably volatile, and cannot well be preserved at ordinary temperatures, but may be made use of to mix with the ordinary nitric acid, so as to convert it into fuming acid.—*London Chem. Gaz. from Mittheilungen der Naturf. Gesellsch. in Bern.*

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#### ON THE PREPARATION OF CALOMEL IN THE HUMID WAY.

BY PROF. WÖHLER.

It has long been known from Vogel's experiments, that perchloride of mercury is precipitated from the solution of the perchloride by sulphurous acid. This behavior appears to me to be available in the practical preparation of calomel. It is obtained in this manner as a very delicate powder, of a dazzling white color, which glitters in the sunlight. The difficult process of sublimation and the tedious preparation would thus be avoided; and its preparation in the laboratory would be a very easy matter. It would be obtained immediately in the finely divided state in which the pulverulent sublimed calomel is produced, without any necessity for an operation of so much danger as the preparation of calomel by sublimation, which moreover can only be performed on a large scale. As the calomel formed by sulphurous acid is crystalline, and therefore in the same condition as the sublimed, there can also be no doubt that it will not differ from this in its medicinal efficacy. The crystals may be distinctly recognized, even with a magnifying power of only 100 diameters; they are generally united, forming regular crosses.

For its preparation it is only necessary to dissolve commercial perchloride of mercury in water heated to about 122° F. until this is saturated, and afterwards to pass sulphurous acid gas into the hot solution. The gas is evolved by heating coarse charcoal powder with concentrated sulphuric acid. The separation of the calomel commences immediately. When the solution is saturated with gas, it is digested for some time, then left to get cold, and filtered from the calomel, which is afterwards washed. The filtrate usually still contains some unchanged perchloride, which may be converted into calomel either by heating to boiling, or by a fresh introduction of sulphurous acid and heating. It still



remains to be ascertained what temperature is the most proper for the conversion of the whole of the perchloride into calomel. —*Chem. Gaz.*, July, 1854, from *Ann. der Chem. und Pharm.*, xc. p. 124.

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## ON VEGETABLE BRONZE-COLORS FROM BRAZIL-WOOD AND LOGWOOD.

BY L. DENZER.

When alum is dissolved by heat in a decoction of Brazil-wood, which has been cleared by standing for several days, a precipitate is produced on the cooling of the solution, which increases in proportion to the length of time the fluid is left standing, and at last contains nearly all the coloring matter. If this precipitate be washed once with water, and spread in a tolerably thick coating upon paper, it dries with a beautiful shining gold color, with a slight tendency to green, very like the dried wing-cases of the common *cantharides*. If the precipitate be made into a paste, mixed with a little size and glaze (prepared by dissolving wax in soap), and then laid on the paper by means of a brush, it may be polished with an agate or glass ball, and then acquires a beautiful yellow metallic lustre, exactly like bronze. It is, however, necessary for this purpose, that the paper should be so thickly coated with the color as to render it quite opaque.

A coloring matter obtained from logwood has exactly the same properties, but its preparation is somewhat different, and the metallic lustre has more of a coppery tint, the former rather resembling brass.

If a freshly prepared concentrated decoction of logwood be heated in a copper kettle, and then mixed with chloride of tin, an abundant dark brown precipitate is obtained, which is to be collected without washing. The precipitate, when employed like the preceding one, communicates a copper-bronze color to paper. A different shade is obtained when the hot decoction of logwood is first mixed with a little alum, and afterwards with a still smaller quantity of bichromate of potash; this precipitate is darker, and its lustre, when laid on paper, has more of a yellowish tinge, so that it forms an intermediate shade between the other two colors.



All these precipitates are particularly adapted for the fabrication of marbled papers and paper-hangings ; for if the mixture of the size, glaze, and color is well effected, the metallic lustre makes its appearance even on rubbing with a stiff brush.

As a guide in the preparation of these colors, I give the following formulæ :—

1. 10 lbs. of good Brazil-wood are deprived of their coloring matter by repeated decoction in river-water, and the collected decoctions left standing for from four to eight days in an open wooden tub. The clear decoction is then poured away from the sediment, and put again into a clean vessel. Part of it is then heated, and whilst hot 5 lbs. of alum are dissolved in it, and the solution is mixed with the remainder. The precipitate will have collected in about eight days ; it is strained through cloth till it acquires a pasty consistence, and preserved for use in that form.

2. 10 lbs. of logwood are boiled twice with river-water, and the strained decoction evaporated to one-half in the kettle ; 10 oz. of chloride of tin are then added, and the precipitate is strained through cloth.

3. The decoction is prepared and concentrated as before, and 10 oz. of alum are added to it, and allowed to dissolve ; powdered bichromate of potash is then sprinkled in gradually as long as a sample taken out and laid on paper still appears dark blue ; for this purpose  $1\frac{1}{4}$  oz. are generally required. Too much of the bichromate of potash renders the color black, and spoils it. This is also strained through cloth.—*Chem. Gaz.*, July, 1854, from *Dingler's Polyt. Journ.*, cxxvi. p. 433.

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#### ON THE CHANGES PRODUCED IN THE BLOOD BY THE ADMINISTRATION OF COD-LIVER OIL AND COCOA-NUT OIL.

By THEOPHILUS THOMPSON, M.D., F.R.S.

The author has found that during the administration of cod-liver oil to phthisical patients their blood grew richer in red corpuscles, and he refers to a previous observation of Dr. Franz Simon to the same effect. The use of almond-oil and of olive-oil was not followed by any remedial effect, but from cocoa-nut oil results were obtained almost as decided as from the oil of the liver of the Cod, and the author believes it may turn out to be a

useful substitute. The oil employed was a pure cocoa oleine, obtained by pressure from crude cocoa-nut oil, as expressed in Ceylon and the Malabar coast from the *Copperah* or dried cocoa-nut kernel, and refined by being treated with an alkali and then repeatedly washed with distilled water. It burns with a faint blue flame, showing a comparatively small proportion of carbon, and is undrying.

The analysis of the blood was conducted by Mr. Dugald Campbell. The whole quantity abstracted having been weighed, the coagulum was drained on bibulous paper for four or five hours, weighed and divided into two portions. One portion was weighed and then dried in a water oven, to determine the water. The other was macerated in cold water until it became colorless, then moderately dried and digested with ether and alcohol to remove fat, and finally dried completely and weighed as fibrine. From the respective weights of the fibrine and the dry clot that of the corpuscles was calculated. The following were the results observed in seven different individuals affected with phthisis in different stages of advancement:—

		Red corpuscles.	Fibrine.
First stage, before the use of cod-liver oil . . .	Female	129.26	4.52
	Male	116.03	13.57
First stage after the use of cod-liver oil . . .	Female	136.47	5.00
	Male	141.53	4.79
Third stage, after the use of cod-liver oil . . .	Male	138.74	2.23
	Male	139.95	2.31
Third stage, after the use of cocoa-nut oil . . .	Male	144.94	4.61
		<i>Chem. Gaz., July 15, 1854.</i>	

#### POISONOUS EFFECTS OF SODA WATER FROM COPPER FOUNTAINS AND LEAD PIPES.

By R. OGDEN DOREMUS, M. D.

Having, within a few days, had several friends relate their sudden illness after taking a single glass of soda water, and suspecting some poisonous impregnation to be the cause, I was induced to obtain several gallons of this favorite beverage, from different parts of the city, and to submit them to a chemical examination.

The substance which first attracted attention was *copper*.

This was very abundant in soda water obtained from several obscure shops, where it was presumed the traffic was limited, and consequently the acid water remained longer in the copper condensers. It was so evident that, on boiling off the excess of carbonic acid gas, a green scum made its appearance, which, on further evaporation, settled. This was carbonate of copper, previously held in solution by the carbonic acid.

The amount of metallic copper in a quart was one grain and a half!

Soda water obtained from the same establishment on different days, was found to contain varying amounts of the poisonous carbonate.

The source of this copper, and the cause of these differences, may be accounted for in several ways.

The copper condensers purport to be tinned internally; but where they have been in use a long time, the tin, by chemical and mechanical action, has been removed, at least in part; thus exposing a surface of copper to the corrosive action of the carbonic acid, aided by sulphuric acid, which is occasionally found in the soda water.

Although the carbonate of copper is insoluble in *pure* water, it is capable of being held in solution in water highly charged with carbonic acid gas for the soda water which yields this green scum after discharging the gas, is clear and colorless previous to the operation.

The soda water drawn shortly after charging the condenser, would necessarily yield less copper on analysis, than that obtained from the same fount after having several days to exert its corrosive influence. Again, the tinning (for all are professedly thus lined) would be more perfect in some than in others—dependent not only on the length of time the condensers have been used, but also on the completeness of the original coating. I have been informed that, in order to facilitate the flow of the tin, soft solder is at times resorted to, or the copper is washed with a salt of mercury. Under these circumstances, the chemical and electrical action would be rather complicated, and the soda water possessed of remarkable *medicinal virtues*.

The second poisonous compound which, from its abundance,

demanding investigation, was a white precipitate, the carbonate of lead. This was found, to a greater or less amount, in most of the waters examined.

In the quart whence the grain and a half of copper was obtained, 0.65 of a grain of metallic lead was found.

The chief source of this impregnation is the lead pipe used in many fountains to convey the carbonated water from the condensers to the jet.

It is an established fact, that the free carbonic acid found in spring waters, is capable of dissolving or facilitating the solution of many of the salts of lead, such as are found encrusting lead-pipes which have been used for conducting said waters.

By the investigations of Dr. Ellet, published in this city last year, it was clearly shown that even the trivial amount of carbonic acid found in Croton water, is sufficient to act upon the lead-pipes.

This lead may be readily found in any kettle which has been used for boiling the Croton water passed through a lead-pipe, by adding a little acetic acid to it. The acetate of lead will respond to sulphuretted hydrogen, by assuming a black tint (the sulphuret of lead,) or a yellow tint with the iodide of potassium, etc.

Since carbonic acid is possessed of such solvent powers, soda water, which is surcharged with it, must become poisonously contaminated by contact with lead, either in the pipes or the soldering; and as much of the tin of commerce is alloyed with lead, even this metal, to which we look for protection, may be another source of evil.

Many are impressed with the belief that the first few glasses may be impregnated with lead to an injurious extent; and hence the custom, in the more respectable establishments, of discarding the soda water which is first drawn, and has lain in the tube over night.

Wherever lead pipes are used to conduct the water to the jet and especially where, in order to secure a cool draught, from thirty to sixty feet of lead pipe are coiled in a tank and covered with ice, the highly acid liquid must necessarily dissolve the metal, and communicate the poison to all contained within the condenser.

These remarks are not applicable to pipes of pure tin, or of lead properly coated with tin.

I have examined the soda water obtained from a manufactory where it is bottled, but could discover neither copper nor lead.

The effervescent liquid which is at times "palmed off" upon the public, made by forcing atmospheric air into water (most truly, "aërated water,") would, from the very want of the carbonic acid, be nearly free from these contaminations.

It might be asked, "If these poisonous bodies exist in soda water, why are not the effects more commonly known?" I would reply, they are more generally known than is supposed.

Since commencing these investigations, I have learned from several medical friends, that a coppery taste, violent vomiting, colic pains, purging, etc., have not been uncommon results from such draughts; and most with whom I have conversed, have experienced these effects personally.

In Dr. Mitchell's Therapeutics, mention is made that soda water from old copper fountains is strongly marked with the copper taste.

My assistant informs me that five years since, while in a drug store, he observed that vomiting and other symptoms of poisoning by copper followed frequently after drinking soda water, and that many thought it was cholera; and after being similarly affected himself, he tested the water and found copper.

I am informed by a resident of St. Louis, that while the cholera prevailed, most persons abandoned the use of soda water; it was a common remark, "Mr. — took a glass of sodawater, and was immediately attacked with cholera."

Probably the syrups, which are the usual accompaniments of the soda draught, act in many cases as an antidote; for although the efficacy of sugar in this respect, as originally proposed by Duval, was denied by Orfila, it has lately been re-asserted by Postel.

I regret that, for want of time, I have not been able to complete other experiments on this subject; yet, as I am convinced that in many cases this poisoned soda water has proved the exciting cause of cholera in those predisposed to this disease, and in others that it has by its inherent properties been injurious to health or destructive to life; and as at this time the cholera question is again agitating the public mind, I have thought it advisable to relate the results of this partial investigation.

With the knowledge of these facts we may conclude that, although soda water may be retained in a *well-tinned* copper condenser, and discharged through a *thoroughly tinned* lead pipe, without poisonous impregnation, yet, as any imperfection in the tinning of either, or long or careless usage, may expose the copper or the lead (or both) to the solvent powers of this carbonic acid, and thus render the beverage dangerous, therefore these vessels should be discarded or only permitted in the hands of trustworthy persons.

Condensers of stone, of iron, or of the purest block tin, supported by iron bands, or of gutta percha, aided in a similar manner, would be free from poisonous impregnation. Conducting pipes of these latter materials are likewise unobjectionable.

In another paper I shall present the results of more extended investigations, and shall be indebted to any physicians or pharmacutists who feel disposed to assist in this work of common interest, by favoring me with reports of cases, or samples of suspected liquid for analysis. If those engaged in the fabrication of this article would afford an opportunity of examining some of the old soda fountains, it might aid materially, and perhaps result in the suggestion of better methods of protection.—*American Medical Monthly*.

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#### PRACTICAL OBSERVATIONS ON THE OINTMENT AND DISTILLED SPIRIT OF CUCUMBERS.

By M. EMILE MOUCHON, of Lyons.

M. Mouchon, after observing that the process of M. Buron, for cucumber ointment, made from the distilled spirit of cucumbers, is better than that made from the juice, as proposed by Lemery and MM. Henry and Guibourt, proposes the following formulæ for the two preparations.

##### *Distilled Spirit of Cucumbers.*

Take of Cucumbers, of medium size, sixteen pounds.

Rectified alcohol (36° B.) one pound.

Reduce the cucumbers to a pulp, without rejecting the rind, incorporate the alcohol in the liquid mass, place the whole in a still furnished with a diaphragm, and after macerating twenty-four



hours, distil off slowly, one pound of spirit marking 19° of the areometer.

This recipe contains a larger proportion of alcohol than that of M. Buron, and the spirit obtained is stronger and more aromatic than his, which has the strength of 14°.

The pound of distilled spirit represents but a part of the alcohol employed, and the cucumber pulp yet retains a part of its aroma, hence there is an advantage in continuing the distillation till another pound is obtained, which may be reserved for use or for another operation.

*Cucumber Ointment.*

Take of Lard, (benzinated*)	75 parts.
Stearine,	25 “
Spirit of cucumbers,	12 “

Cut the stearine in pieces, melt it in a water bath with the benzinated lard, and pour them into a large mortar of marble or porcelain; beat the melted mass vigorously during the cooling, add the distilled spirit and continue to beat them in the same manner till the product is of very great whiteness and levity.

Prepared in this manner cucumber ointment has not only the qualities presented by the best Parisian article, even that of M. Chardin-Hadancourt, which is esteemed the highest, but it also has the property of keeping a long time in a good condition, owing to the aromatic principles which exist in the benzinated lard when made by my process, and which appear to facilitate the molecular incorporation of atmospheric air so necessary to its beauty.

M. Pottier, Pharmacien of Auxerre, has published in the *Repertoire de Pharmacie*, 1847, 130, a process in which distilled water of cucumbers was used in lieu of the spirit of M. Buron, but this does not keep so well as that made by the process of M. Buron.

The alcohol of the spirit is almost wholly driven off during the continued process of beating (or whipping) the ointment with a spatula, and hence the objection which some may incline to raise against the use of the spirit in this formula is of no force.

\* Lard is benzinated by digesting it with powdered benzoin in the proportion of ʒij to the pound.



## ON GLYCERIN LOTIONS OF MORPHIA, STRYCHNIA, VERATRIA AND ATROPIA.

The importance of applying active medicines externally until absorption occurs sufficiently to cause their peculiar effects on the patient, has often been resorted to with great propriety in cases where their internal administration was rendered unadvisable from gastric derangement. Quite recently M. Soubeiran has proposed glycerin as a vehicle for morphia, in lieu of the "oil of morphia" of M. St. Lager, and a writer in the *Bulletin General* takes advantage of this suggestion, and brings forward formulæ for similar preparations of strychnia, veratria and atropia, under the generic title of "*Glyceroles*," or *glycerin lotions*.

M. Soubeiran's formula is as follows :

Take of Acetate of morphia,	three grains.
Glycerin,	five drachms, <i>troy</i> .

Dissolve.

The *Lotion of Strychnia* is made thus :

Take of Sulphate of strychnia,	six grains.
Glycerin,	five drachms, <i>troy</i> .

Dissolve the salt in the glycerin in a porcelain mortar.

A teaspoonful of this lotion is applied by friction in paralysis of the limbs,—on the vertebral column in chorea,—on the temples in certain cases of amaurosis. It is necessary to remember that it is not the alkaloids but their *salts* that are soluble in glycerin, and when only the free alkaloids are officinal in the *materia medica*, as veratria or atropia, it is necessary to dissolve the organic base in a little diluted chlorohydric acid.

*Lotion of Veratria.*

Take of Veratria,	fifteen grains.
Diluted muriatic acid,	q. s.
Glycerin,	five drachms.

Dissolve and mix.

A teaspoonful applied by friction in chronic rheumatic pains of the joints, or in the sacro-lumbar region to relieve painful menstruation.

*Lotion of Atropia.*

Take of Atropia,	six grains.
Diluted muriatic acid,	q. s.
Glycerin,	two and a half drachms.

Dissolve and mix.

Forty or fifty drops applied by friction, repeated three times a day on the track of the sub and super orbital nerves, on that of the facial nerve, &c.—*Jour. de Pharm.*, July, 1854.

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#### USE OF MUREXIDE IN DYEING.

Attempts have recently been made to communicate a purple color to textile fabrics, by the production of murexide in their fibres. As yet they have been successful only in the case of wool:

The idea of using murexide for dyeing is not new, but the difficulty consisted in fixing it upon the fabric, and procuring the substance at a sufficiently cheap rate.

Dr. Sacc was induced by the fact that a solution of alloxan stained the skin purple, owing to the production of murexide, to try whether woollen cloth steeped in a solution of alloxan, would acquire a purple color, and he found that this really is the case, the color produced being far finer than that of cochineal.

M. A. Schlumberger adopts the following process:—The fabric to be dyed is soaked in a solution of alloxan (30 grms. to 1 liter), wrung, dried at a gentle heat, and after an ageing of twenty-four hours, the color brought out by passing the cloth over a roller heated to 212° Fahr. The intensity of color varies according to the strength of the alloxan solution, and washing with cold water produces the full degree of brilliance.

M. Sacc found that the finest colors could only be communicated to fabrics mordanted with persalts of tin. They obtained the best results with a solution of equal parts of perchloride of tin and oxalic acid, having a density of 1.006. Cloth freshly mordanted gave better results than cloth which had been mordanted for some time.

A committee was appointed by the Société Industrielle at Mulhausen to inquire into this subject, and they suggested that, as murexide is produced by the action of heat and ammonia upon alloxan, the cloth should be exposed to ammonia vapor after being treated with alloxan. By this means the ageing of the cloth is rendered unnecessary, and a saving of alloxan is effected, for this substance is liable to be decomposed by the traces of protochloride of tin or sulphurous acid, retained by the cloth after bleaching.

All attempts to fix the murexide purple upon cotton or silk have failed ; on wool, however, it is permanent.

Light appears to have little action upon murexide purple, which has the advantage over the colors produced from cochineal in being generally more solid and durable.

With regard to the sources whence alloxan—or uric acid, the substance from which it is derived—may be obtained, it may be observed that guano is rich in uric acid, and likewise the excrements of pigeons, carnivorous birds, and silkworms.

M. Schlumberger has indulged in some curious speculations relative to the existence of this coloring matter ready formed in nature, which it may be interesting to notice. M. Sacc has found that poultry, and especially birds with very brilliant plumage, such as the different paroquets, do not produce sensible traces of uric acid during their period of moulting, whilst the quantity is very large when their feathers are fully developed. The question naturally suggests itself, what becomes of the uric acid in the former case ? May it not be transformed by some as yet unknown metamorphoses in the animal body into a substance like alloxan, capable of coloring the feathers ? Murexide, as we have observed, is green by reflected light : a substance, then which gives violet (red and blue) and green (yellow and blue) can undoubtedly produce all shades of colors which are made up of those three colors. How curious if it should hereafter be found that murexide was indeed the source of all the varied hues of birds' plumage ! Still further, it is chiefly those animals which have but one means of exit for their excrements, and who produce large quantities of uric acid, that exhibit a display of coloring. Thus, for example, we have the skin of the serpent and lizard, the scales of fish, the wings of butterflies, often colored in the most gorgeous manner, whilst the skins of the mammalia are dull, and without that iridescence and metallic lustre which is so characteristic of the coloring of some of the classes of animals mentioned. These are, however, mere speculations, but they nevertheless lead to a very unexpected supposition. The ancients were acquainted with a process for dyeing wool of a fine purple, which has been lost to our days, or at least is only practised in the East. Tradition, however, tells us that this beautiful purple tint was produced by pounding a quantity

of small shell-fish, and adding to the mass either a quantity of urine in the state of putrefaction, or water in which some of the same shell-fish had been allowed to putrefy. The cloth soaked in the liquid produced by these mixtures only developed the beautiful purple color after long exposure to the air, and probably to heat. This mode of producing the color so strikingly resembles that by which the new color of murexide is produced, that one is tempted to believe that the Tyrian purple was produced by that substance, and that many centuries before the beautiful discovery of Liebig and Wöhler, murexide was formed by the action of ammonia, in the putrid matter employed, upon substances derived from the uric acid which would exist in the intestines of the shell-fish pounded up.—*Pharmaceutical Journal*, July, 1854, from *Bulletin de la Société Industrielle de Mulhouse*, No. 123, p. 242; and *Dublin Journ. of Indust. Progress*, June, p. 173.

#### DETECTION OF POPPY OR NUT-OIL IN OLIVE-OIL:

By E. MARCHAND.

In consequence of the frequent adulteration of olive-oil, the author had occasion to examine the various methods of detecting it, and has found that the use of sulphuric acid gave satisfactory results.

He describes the process thus :—When 4 drops of olive, poppy, or nut-oil are placed separately upon a slab of porcelain, and 2 drops of pure concentrated sulphuric acid added, and mixed with the oils by inclining the slab to one side and the other, the following phenomena are observed :—

*Olive-oil* acquires, at the points of contact with the acid, a yellow color passing into orange; the liquid portion surrounding the magma rapidly becomes dirty gray, and then brownish-black, while the yellow color first produced by the acid gradually passes into bright chestnut-brown. There is never any appearance of blue or lilac tints.

*Poppy-oil* acquires, immediately at the points of contact with the acid, a fine lemon-yellow color, which becomes rapidly darker at some parts. The liquid portion in contact with the colored portions never acquires the dirty gray color characteristic of olive-oil. After the reaction has continued for ten or fifteen minutes, there is observed, at several points of the liquid portion

which immediately borders upon the colored part, a rose color, passing rapidly into bright lilac, and gradually increasing in intensity. After half or three-quarters of an hour, the lilac color passes into a violet blue, while the original yellow gradually becomes dull brown.

*Nut-oil* behaves almost exactly the same as olive-oil, except that the yellow substance is more abundant, more rapidly formed, and becomes brown more rapidly, so that within less than ten minutes it acquires a chestnut color. Sulphuric acid is far more easily miscible with this oil than with olive or poppy-oil. The gray border, which is characteristic of olive oil, is produced with nut-oil as well; but in this case, instead of gradually becoming black, it passes rapidly into olive-green. This oil never produces a tint of lilac.

*Mixtures of Olive and Poppy-oils* may be tested by means of the above reactions. After a certain time, the colors characteristic of poppy-oil, pink, lilac, violet, blue present themselves successively, with an intensity proportionate to the quantity of poppy-oil present. Marchand states, that with practice, one-tenth poppy-oil in olive-oil may be detected with certainty by this method.

*Mixtures of Olive and Nut-oils.*—When the nut-oil amounts to one-fourth of the whole, sulphuric acid produces a bright orange-yellow color, with a gray border, the outermost parts of which pass into olive-green. A mixture of equal parts of both oils gives an orange-yellow color, with a very distinct gray border, which soon becomes greenish and brown at the outer edge. When the mixture contains three-fourths nut-oil, a reddish-yellow color is produced, surrounded by an olive-green border, paler than that produced with pure nut-oil.

*Mixtures of Poppy and Nut-oils* acquire with sulphuric acid a yellow color, and at the borders a grayish tint, gradually diffusing itself over the liquid part. When the mixture contains one-fourth nut-oil, an intense lilac is subsequently produced, while the yellow color passes into chestnut-brown. When the mixture contains three-fourths nut-oil, an orange-yellow is produced, with gray borders, passing at certain points into olive-green. Subsequently the yellow becomes bright chestnut-brown.—*Chem. Gaz.*, March 15, 1854, from *Journ. de Pharm.*, October, 1853; and *Pharmaceutical Journal*.

## UREA IN ITS RELATIONS TO THE GENERAL PHENOMENA OF ANIMAL PHYSIOLOGY.

BY THOMAS BISCHOFF.

There is no longer any doubt that accurate knowledge of the phenomena of animal organism can only be acquired by the aid of a more intimate acquaintance with the unceasing chemical metamorphoses which take place in them. These changes must be understood, not only qualitatively but quantitatively, before our views on this subject can possess any scientific precision.

Towards the attainment of this object much has already been achieved, but indefinitely more remains to be done. This is particularly the case with regard to the metamorphoses of the nitrogenous constituents of the organism which are justly considered to be of such predominant importance in its actual activity. The history of the nitrogenous elements of food is at the present time incomparably more extended and minute than formerly. So likewise the study of the nitrogenous excretions, particularly urea, has been abundantly and productively cultivated. No doubt is entertained that it is derived from the nitrogenous elements of food, but with regard to the quantitative and even qualitative relations which obtain between them there is the greatest uncertainty and diversity of opinion.

While some regard urea as the ultimate product of a series of metamorphoses of the nitrogenous elements of food which can be developed only in the living organism and by the action of the organs, others entertain the opinion that the albumen of the blood is converted directly into urea, even in the blood.

According to the former view, urea, independently of some other less important nitrogenous excretions, might be regarded as a quantitative measure of metamorphoses in the nitrogenous organs, a circumstance which would be of incalculable value with reference to the functions and agency of these organs. Such a proceeding is, however, inconsistent with the latter view, which represents the quantity of urea as dependent upon the accidental quantity of albumen in the blood.

An unprejudiced consideration of the researches which have hitherto been instituted for the purpose of deciding these questions, will at once show that they are altogether unsatisfactory.



For on the one hand the chemical methods adopted for the quantitative estimation of urea were either liable to inaccuracy, or involved troublesome and tedious operations, which were applicable only in a few particular instances. On the other hand, it was certain that the constitution of urine and the quantitative relation of its several constituents are variably influenced by so many circumstances, that a correct insight into its qualitative importance and quantitative excretion could only be attained from a very great number of observations, and when the conditions under which they were made were exceedingly varied, and at the same time well known and definite.

If, therefore, the relation of urea to the general functions of life are to be more exactly investigated, and if the quantity in which it is excreted is to be recognized as the measure of metamorphosis of nitrogenous constituents of the organism, a method must be found for its quantitative estimation which will be at once certain, facile, and rapid in its execution.

Such a method has been contrived by Professor Liebig, which, with a little practice, admits of an estimation of urea being made in a quarter of an hour. I have in this manner instituted a large number of experiments with human urine and that of dogs and rabbits. The quantity of urea that the dog formed under the most diverse conditions of feeding was daily estimated during a whole year, The same was done for a period of five months with a rabbit.

For the human organism I have only endeavored to ascertain the quantitative relations of urea under the normal circumstances of life during long periods and for individuals of different sex and age. The results which have thus been obtained present very considerable discrepancies with the statements previously made.

In the case of the animals mentioned, however, I have more especially convinced myself that the determining conditions for the formation and excretion of urea are far more variable and multiform than has hitherto been supposed, and that they are influenced by circumstances so numerous and changeable that there is still a necessity for a much larger accumulation of accurate observations before the laws of this excretion and its correlative phenomena can be definitely evolved.



Although at present we can only consider the first step as having been taken, I believe that I have obtained some results which, while they remove previous doubt and present the subject under new aspects, may perhaps serve as the basis of further research.

Among these results are the following :

1. Urea is unquestionably, under all circumstances, the measure of the metamorphosis of nitrogenous constituents of the organism. It never originates from a direct metamorphosis of the albumen of the blood and vascular system. It is formed in the blood only from gelatin, and this perhaps never enters the blood unaltered in the normal conditions of life. The urea in this case is not a product of the metamorphosis of solid portions of the organism.

2. But although urea always originates in this manner from the metamorphosis in the organs, still, the quantity and quality of the food exercise a far greater influence upon the production of urea and the general metamorphosis than could hitherto have been supposed. It is indeed true that urea is formed and excreted under a total deprivation of food ; but the per centage of nitrogen in the food exercises so great an influence upon the quantity, that when, for example, the dog on which I made my observations consumed in twenty-four hours 4000 grms. of cow flesh without fat or bone, he excreted in the same time 190 grms. of urea, while with 500 grms. of potato and 250 grms of fat the quantity excreted was only 6 or 8 grms.

Food destitute of nitrogen, such as fat, under all circumstances produces a limitation of the metamorphosis of the nitrogenous portions of the organism. At the same time there is in most instances, *cæteris paribus*, a diminution in the quantity of urea excreted, but not always. When the food consists solely of fat both consequences obtain ; the excretion of urea as well as the metamorphosis is diminished. The same is the case with a very full flesh diet. With a flesh diet merely sufficient for maintaining the weight of the body fat limits the metamorphosis, but the quantity of urea excreted is not necessarily diminished at the same time ; it may indeed become greater than that excreted when the same quantity of flesh is consumed without fat, in accordance with a law stated subsequently.

3. It has moreover been found, that the quantity of nitrogen in the food or portions of the organism metamorphosed within a certain period never appears entirely as urea, but that a certain, and under some circumstances considerable part, must be excreted in another form. This is likewise true in the case of dogs, although their urine does not contain uric acid, and scarcely a trace of other nitrogenous organic substances. Only very small quantities of nitrogen are excreted in the fæces, and as this is also true with regard to the lungs and skin, according to admirable researches of Regnault and Reiset, it is difficult to form a correct opinion as to the form in which that part of the nitrogen of metamorphosed portions of the organism that is not found in the urine is excreted. It is most probable that this deficiency is owing to a partial conversion of urea in the blood, or perhaps even in the bladder, into carbonate of ammonia, which is excreted either by the skin and lungs or in the urine. However worthy of confidence the observations of Regnault and Reiset may be, I am still of opinion, that it has not hitherto been possible to continue them for a sufficiently long period, and under the necessary alterations of diet for determining with absolute certainty, whether or not carbonate of ammonia is excreted by the skin and lungs. The presence of carbonate of ammonia in the urine would be very probable, at least when, even with an exclusively flesh diet, or under a deprivation of food, it was alkaline while quite fresh and effervesced on the addition of an acid.

The quantity of nitrogen of the metamorphosed portions of the organism, which does not make its appearance as urea, is upon the whole tolerably constant under very diverse circumstances of diet and metamorphosis. It was found greatest, both relatively and absolutely, under a deficient supply of nitrogenous food (250 grms. of flesh.) It might in this case amount to more than two-thirds of the total nitrogen of the metamorphosed tissues. With a supply of nitrogenous food adequate for maintaining the weight of the body (500 grms. of flesh) it amounted to one-third. Under a very full and excessive flesh diet it was smaller absolutely than in the above cases, and was consequently so much reduced, relatively, as to be almost insignificant. I regard these facts as the strongest evidence that the original product of metamorphosis of nitrogenous tissues is solely urea, of

which a certain portion experiences a further change—into carbonate of ammonia—proportionately greater when the quantity of urea is large than when it is small. The presence of fat in the food appears under certain circumstances to prevent or limit this further alteration of urea. It is owing to this influence, that although fat, as already remarked, limits the metamorphosis, and consequently the formation of urea upon the whole, still under a diet consisting of flesh and fat, the quantity of urea excreted may become greater than when the same quantity of flesh is taken without fat, because the nitrogen of the metamorphosed tissues remains in the form of urea. I am of opinion that fat exerts this influence by virtue of its connexion with the process of respiration. Lastly, water exercises an influence upon the deficiency of nitrogen appearing as urea. Thus, for instance :

4. The quantities of water and urea always bear a very constant relation to each other. No other constituent of the urine has so decided an influence upon its density as urea. Dense urine always contains much urea ; specifically light urine is always poor in urea. Nevertheless, the quantity of urea excreted upon the whole within a given period, is related in the most intimate manner with the quantity of water, and *cæteris paribus* a large quantity of urine carries off more urea than a small quantity passed in the same time, although its specific gravity may fall considerably at the same time.

This influence of water may be owing to several circumstances—an increased facility in the solution and extraction of urea ; perhaps also to an increased facility in the formation of urea. But it is moreover quite certain that water has an influence upon the quantity of urea in so far as the time and rapidity with which the urine is evacuated depend upon its greater or less quantity. In the presence of much water the urea formed is very rapidly separated from the blood and from the organism. There is not much time then for any further alteration of the urea, and consequently its quantity is greater while the quantity of nitrogen not in the form of urea becomes less. Hence it is more particularly explicable why with different quantities of nitrogenous food (flesh ; ) with little there is a comparatively and even absolutely great deficiency of nitrogen in the state of urea, and with much flesh, on the contrary, little deficit. For in the former case the

quantity of urine passed is very small, often only a few cubic centimeters during several days; in the latter, on the contrary, very great, amounting to 1200 or 1500 cubic centimeters in twenty-four hours.

It follows from these facts, perhaps with certainty, that the quantity of urea excreted under certain circumstances and within a certain time, cannot be taken as the direct measure of metamorphosis in the tissues, even when the urine does not contain any other nitrogenous constituent. Still it will always be the most important element for ascertaining its amount, and it will only be necessary to study more closely the influences exerted upon its formation and excretion, towards the elimination of which I hope to have furnished some contribution.—*London Pharm. Journ.*, from *Annalen der Chemie und Pharmacie*.

# ON THE FREQUENT PRESENCE OF IODINE IN MINERALS, PLANTS, AND ANIMALS, AND THE VARIOUS TESTS FOR ITS DETECTION.

By E. RIEGEL.\*

Recent investigations have shown that iodine occurs in small quantities much more frequently than was hitherto supposed, and a statement of the various cases in which its presence has been observed, may have some degree of interest for many. The marine plants in which iodine was first discovered, appear to contain the largest quantity:

	Per centage of Iodine in the dry plant.
<i>Fucus filium</i> . . . . .	0.0894
“ <i>digitatus</i> . . . . .	0.135
“ <i>saccharinus</i> . . . . .	0.230
“ <i>vesiculosus</i> . . . . .	0.001
“ <i>saccatus</i> . . . . .	0.124
“ <i>siliquosus</i> . . . . .	0.142

*Fucus nodosus* and *lorcus* contain a little iodine, so likewise *fucus cartilagineus*, *membranaceus*, *rubeus* and *palmatus*, according to H. Davy, Gaultier and Fyfe; *sphærococcus crispus*, accord-

[\*We have published several articles in reference to this subject, but now introduce Dr. Riegel's article as being a general compendium of what has been written and observed.—EDITOR AM. JOURN. PHARM.]

ing to Sarphati; *sphærococcus helminthocorton*, according to Straub, Happ and Gaultier; in *ulva linza*, *pavonia*, according to Sarphati, H. Davy and Balard. Meyer found the per centage of iodine in

Ulva umbilicalis	.	:	.	0.0590
“ lactuca	.	.	.	0.0550
Zostera marina	.	.	.	0.0005

It had long been known that the ash of fuci and other marine plants, as well as the varec of Brittany and the kelp of Scotland, according to Courtois and Fyfe, contain a quantity of iodine by no means inconsiderable, while the ash of *salsola* and other land plants, as well as the Spanish barilla and the Roman and Sicilian soda, contain, according to Fyfe and H. Davy, little or no iodine. Duvault is of opinion that the iodine of marine plants exists in the form of iodide of potassium. The presence, according to Dickie, of iodine in *lichen confinis*, *statice armeria*, and *grimmia maritima*, growing upon rocks to which the wind sometimes carry sea water, and its absence in *remelina scopulorum*, growing in the same place, is curious.

Iodine has likewise been found in *jungermania albitans*, by W. v. der Marck; in *j. pinguis*, in *confervæ* and *oscillariæ*, especially *o. grateloupi*, by Meyrac; in *armeria maritima*, when growing near the sea, by Völcker; in *nasturtium officinale*, by Müller. Fyfe, Sarphati and Dickie, did not find iodine in *salsola kali*, *plantago maritima* and *nicotiana tabacum*, which grew near the sea. It was found by Busse in *muscus corallinus*; by Righini in *asplenium trichomones*, *aspidium capillus veneris*; by Straub, in the turf of Hofwyl; by Guillermond in sarsaparilla root. Iodine was long since detected in the potash of commerce, and more recently Lamy and Fehling found it in the potash obtained from the molasses of the beet-sugar factory at Waghäusel, and their observation has since been confirmed by many. Lamy also found iodine in the beet of Waghäusel, but not in the raw or refined sugar, nor any trace of it in the beet or potash from a factory near Valenciennes.

A. Overbeck found iodine in the ash of several *ranunculaceæ*, *r. flammula*, *ficaria ranunculoides*.

It has been found by Gaultier, Fyfe, Straub, Göbel, Stratingh, in sponge, and in the following marine animals—in *spongia ocu-*

*lata*, by Sarphati; in *gorgonia flabellum*, *flustra foliacea*; varieties of *serutularia*, *tubularia*, *rhizostoma* and *cyana*; in *asterias rubens*, *crognon vulgare*, *mytilus edulis*, *ostrea edulis*; varieties of *doris* and *venus* and *pleuronectes flexuo*. The oil prepared from the liver of many varieties of *gadus* contains iodine, according to numerous researches. Gräger gives as the per centage 0.0846; Wackenroder finds that it varies between 0.162 and 0.324.

The oils from the liver of *raja clavata* and *batis* likewise contain iodine, and, according to Girardin and Preisser even more than cod-liver oil. On the other hand, Fyfe, Stratingh and Sarphati, could not detect iodine in the corals, the eggs of *buccinum undatum*, or fish gelatin. According to Jonas Scotch, salt herrings contain only a trace of iodine. Traces were found by Holl in the liquids of *julus fetidissimus*, and by Landerer in crabs, star fish, echini, &c.

The presence of iodine in minerals and natural waters is frequent. It was found by Del Rio and Vauquelin, combined with mercury and silver, in the cerussite of Catorce (Mexico;) by Busermann, Menzel and Cochler, in very small quantity, in Silesian zinc ore; by Fuchs, in the salt of Hall (Tyrol)—according to O. Henry all salts contain iodine—by Hages, Lemberg and Reimbach, in native nitrate of soda.

Duflos found iodine in the Silesian coal; Bussy and Graf confirmed his observation, and the former found it in the form of iodide of ammonium, together with chloride of ammonium, in the combustion products of the burning coal mine at Commentry, as well as in the distillation products of coal; Mene likewise found bromine in the condensed liquor of gas factories.

It is remarkable that Reinsch was unable to detect iodine in the saline efflorescence at the burning coal beds at Duttweiler, although it was found by myself in the coal of that district, and by Genteles in the clay or alum slate of Lathrop (Sweden,) a circumstance which tends to confirm Forchammer's opinion that alum slate was formed by the decay of fuci, &c. The efflorescence at Duttweiler is of two kinds; one consisting, according to Reinsch, chiefly of ammonia-alum, with traces of potash-alum, chlorides of sodium and ammonium, together with very minute quantities of bromide of ammonium, but not a trace of iodine. The other kind is chloride of ammonium, sometimes quite white



and pure. Reinsch found it to contain from one to two per cent. of bromide of ammonium, but no trace of iodine.

Lembert found iodine in the Jura limestones near Lyons and Montpelier. He was unable to ascertain in what state of combination the iodine exists in the limestone, but from the statement of Chatin, that all rocks in which iodine has been detected contain likewise protocarbonate of iron, he is of opinion that this circumstance may explain the presence of iodine in most ferruginous waters.

Chatin detected iodine in clay, vegetable mould, sulphur, cinabar, iron and manganese minerals, in minute quantity in gypsum, white chalk and limestone.

It has been found in a great number of brines and other mineral waters, where, according to Morin, it is in the state of iodide of sodium, calcium, or magnesium; in the brines of Sülze (Mecklenburg;) of Kolberg (Pomerania;) of Salzuflen and Königsbrunn, near Unna, of Rehme, near Minden, of Schonebeck, Halle, Duremberg and Kosen, Hubertsbrunnen, near Thale (Hartz,) Arsern and Salzingen, Schmalkalden, Salzhausen and Creuznach, Bolechow and Drochobyez (Galicia,) Kenohwa (North America,) and in the province Antioquia (New Granada.) In the analysis of the Wurtemberg brines by Fehling, and of the Soolsprudel by Bromeis, no mention is made of iodine, but Denecke found traces of iodide of magnesium in his analysis of the brine at Werl (Westphalia.)

Iodine has been found in the waters of a spring near Saragossa; in the thermal water of Albano; in a spring water near Sales (Piedmont;) in several saline waters near Ascoli; in the sulphuretted water of Cartel Nuovo d'Asti; in the thermal water of Aix (Savoy;) in the water of Bonnington spring, near Leith; in the water of Bad Marienbad, Carlsbad, Heilbrunn, and the spring water of Künzig (Bavaria;) in the goitre water of Hall; in the sulphuretted water of Trutkawiec, and the alkaline water of Inowicz (Galicia;) in the water of Wildegg; the sulphuretted water of Aix la Chapelle; in the spring water of Cheltenham; of Assinam, in India; of Sail-lis Chateau Morand (Dep. d'Loire;) of Sulz (Alsace;) of Varennes (Canada;) of Evaux, Neris, Vichy, St. Honoré, Barages and Cauterets; of Gebagan (India;) Krankenheil (Bavaria;) of the spring near Halle; of springs in Java,



Zahorowitz (Moravia,) Bristol, Salzschlirf, Tatenhausen (Westphalia,) Caledonia spring (Canada.)

Sea water contains so little iodine that Tennant, H. Davy, Gaultier, Fyfe and Sarphati, were unable to detect its presence. However, Balard found it in the Mediterranean water, and Pfaff in that of the Baltic, which is very poor in iodine. Tornt and Herapath found only doubtful traces of iodine in the water of the Dead Sea, and Dugeud believes that the water of the Oldenburgh marsh contains iodine. From what has already been stated as to the presence of iodine in marine plants and animals, it will be seen that they appropriate iodine in considerable quantity as iodide of potassium, sodium, calcium or magnesium.

Chatin detected iodine in rain and fresh water, 0.0002 to 0.0005 in ten liters. The rain water from the interior of France contained far more iodine than that which fell near the sea, and after long-continued rain the water was free from iodine.

The usual method formerly adopted for the detection of iodine was to add starch paste to the liquid to be tested and then nitric acid, which, by liberating the iodine, gave rise to the production of the characteristic blue-colored compound of iodine and starch. Instead of nitric acid, chlorine water may be used to liberate the iodine, but it must be added with great caution, because an excess destroys the blue color so readily that minute traces of iodine may be overlooked. Nitric acid does not itself produce this effect, but when the iodide is accompanied by a large quantity of chloride it liberates chlorine at the same time, so that in such cases the cautious application of chlorine water is preferable.

A solution of nitrate of palladium is recommended by Lasaigne as a reagent for iodine. The protiodide of palladium is black, insoluble, and is deposited only after some time.

A. Reynoso proposes to separate iodine and bromine from metals which prevent its reaction with starch by means of a substance, which does not, like chlorine, combine with it. He uses peroxide of barium, a piece of which is mixed in a test-tube with water, hydrochloric acid and starch paste, and when the evolution of gas commences, the liquid to be tested for iodine is added. When chlorides, sulphurets, sulphites, or hyposulphites are present, their influence as regards the reduction of peroxide of hydrogen may be counteracted by using a larger quantity of per-

oxide of barium. It is stated that a millionth part of iodine may be detected by this test.

Casaseca considers that the use of pure nitric acid with starch is quite as safe as peroxide of barium. In order to detect iodine in mineral water he extracts the dry saline residue with acetic ether, in which the alkaline iodides are soluble, while the accompanying bromides, chlorides, sulphites and hyposulphites are insoluble. The solution is evaporated, the residue dissolved in water, and treated with nitric acid and starch paste.

E. Marchand tests ashes and mineral water for iodine by mixing the aqueous solution in a stoppered vessel with dry starch, excess of hydrochloric acid, and about 0.0001 grm. of chromate of potash. After shaking the mixture and allowing it to rest, a rose color is produced, when ten cubic centimeters of liquid are used, containing only  $\frac{1}{100000}$  of iodine.

Rabourdin takes advantage of the fact, that free iodine dissolves in chloroform with a violet color. If ten grm. of a liquid containing  $\frac{1}{10000}$  of its weight of iodide of potassium are mixed with two drops of nitric acid, fifteen or twenty drops of sulphuric acid, and one grm. of chloroform, the latter acquires a violet color when the mixture is shaken. This color is more intense in proportion to the quantity of iodine present, and may serve for the approximative estimation of iodine by comparison with similar solutions of known value. Chloroform abstracts iodine even from an aqueous solution; when it contains ether the color produced is not violet, but more or less red in proportion to the quantity of ether.

Lassaigne gives the preference to chloride of palladium as a reagent for iodine, which is more delicate than starch, and which has the advantage of indicating the presence of iodine in saline compounds when starch no longer gives a result. He states that he has detected two-millionths of iodide of potassium in 2000 grm. of water by the brown color which chloride of palladium communicates to the liquid. After the lapse of twenty-four or thirty-six hours flocks of iodide of palladium separate, which, when mixed with a little moist silica and heated in a tube, evolve violet iodine vapor.

Winckler recommends as the most delicate test for iodine, next to chloride of palladium, nitrite of potash or soda; he found this

reagent capable of indicating the presence of  $\frac{1}{6000}$  grm. of iodide of potassium by means of the blue color communicated to starch.

According to Grangé, a few bubbles of hyponitrous acid, when free from nitric acid, produce no change in a solution of pure bromide of potassium, while iodides are immediately decomposed, and the iodine separated may be recognized by shaking the liquid with starch or chloroform. Nitrite of potash and hydrochloric acid produce the same effect. The presence of chlorides does not interfere with this reaction any more than that of bromides. Grangé follows this method in testing mineral and other water for iodine, and even for its quantitative estimation. In this case the iodine is liberated by means of hyponitric acid, is separated from the liquid by chloroform, and the colored solution treated with a solution of potash of known value, until the color disappears, or else with nitrate of silver or chloride of palladium.

When chlorine, bromine and iodine are to be estimated quantitatively in a liquid, it is first treated with hyponitric acid, the iodine separated by chloroform, the bromine, liberated by the addition of nitric and sulphuric acids, likewise dissolved out by chloroform, and, lastly, the chlorine precipitated by nitrate of silver. The bromine is also precipitated from its chloroform solution by nitrate of silver.

David Price applies the reaction between nitrites and iodide of potassium with hydrochloric acid to the detection of nitrous acid or of iodine. The liquid to be tested for iodine is mixed with starch, then with hydrochloric acid and a solution of nitrite of potash; when much iodine is present a dark blue color is produced immediately, when it amounts to only two or three millionths the color does not appear until after the lapse of some seconds.

With regard to the sensibility of the various tests proposed for iodine, that recommended by Price appears to be the best. Those of Grangé and Marchand likewise give very trustworthy results. From a comparative study of them I have arrived at the following conclusions:

1. The method adopted by Chatin and Gaultier de Claubry, the use of a mixture of one part nitric acid, six parts sulphuric acid and starch powder, is only capable of indicating  $\frac{1}{375000}$  of iodide of potassium by a very faint violet color. Chatin states

in his Memoirs, that, with a liquid containing rather more than one millionth of iodine, nitric acid produced a very characteristic blue, while sulphuric acid gave only a slight violet, and as I obtained only a faint violet color by the application of pure nitric acid to a liquid containing  $\frac{1}{375000}$  of iodide of potassium, there is some reason for the suspicion that this nitric acid contained iodine.

2. By the test proposed by Grangé  $\frac{1}{500000}$  of iodide of potassium may be detected.

Overbeck, who recommends this test, adds concentrated nitric acid to a small quantity of starch or sugar, in a test-tube, and applies the heat of a spirit lamp until a brisk evolution of gas commences. The gas is passed into the liquid to be tested for iodine which has been previously mixed with starch paste. He states that a blue color is immediately produced by one millionth of iodide of potassium, and that subsequently the starch compound separates in the form of a tangible precipitate. I have not been able to confirm this degree of sensibility for a quantity less than  $\frac{1}{500000}$  iodide of potassium.

3. Lassaigne's test, precipitation with nitrate of palladium, produces, in the presence of  $\frac{1}{100000}$  iodide of potassium, an intense color, and after some time, a precipitate of iodide of palladium; with  $\frac{1}{500000}$  a decided yellow color is produced, but no precipitate.

4. Rabourdin's method—treatment with a mixture of nitric and sulphuric acid and addition of chloroform—indicates  $\frac{1}{100000}$  of iodide of potassium by a distinct violet color; with  $\frac{1}{150000}$  the color appears only after some time.

5. Marchand's process—treatment with chlorate of potash, hydrochloric acid and dry starch—indicates  $\frac{1}{500000}$  by a faint violet color, which is somewhat more distinct than that produced by Grangé's test.

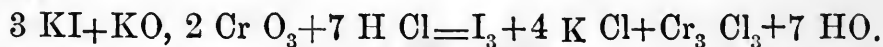
6. Price's method—treatment with nitrite of potash, hydrochloric acid and starch—indicates  $\frac{1}{1000000}$  of iodide of potassium by the production of a violet red color, which is almost as intense as that produced with  $\frac{1}{500000}$  by the method of Grangé. This test has therefore the advantage of being the most sensitive of all.

Some experiments, made with a view to the quantitative estimation of chlorine, bromine and iodine, by means of Grangé's method, showed that it was well adapted for this purpose.

After having satisfied myself that bromides and chlorides are not decomposed by hyponitric acid, and that their presence does not hinder its reaction with iodides, a mixed solution of iodide of potassium, bromide and chloride of sodium, was first treated with hyponitric acid and shaken with chloroform. When, after standing for some time, the colored chloroform solution had separated, it was carefully removed, washed with water, and mixed with a solution of potash of known value until decolorized. The remaining saline solution was then treated with a mixture of nitric and sulphuric acids, shaken with chloroform to separate the bromine, and the chlorine then estimated by precipitation with a nitrate of silver solution of known value. The experiments were made with 0.050 or 0.100 grm. iodide of potassium, the same quantity of bromide, and 1.000, 1.500 and 2.000 grm. of chloride of sodium; the results were as exact as could be expected. The difference in the results did not amount on the average to more than 0.006 for bromide and iodide of potassium, and for chloride of sodium 0.002 grm.

The method proposed by Moride for the separation of these elements by means of benzin, is less advantageous for their quantitative estimation.

Penny's method of estimating iodine—by means of the reaction between solubles iodides, hydrochloric acid, and chromate of potash:



is not to be recommended for general adoption, as it cannot be applied directly to the valuation of commercial iodine or kelp, for in the former case the iodine must be first converted into iodide of zinc, and in the latter the sulphurets, sulphites, hypsulphites and sulphocyanides, must be previously separated.—*London Pharm. Journ.*, from *Jahrbuch für praktische Pharmacie*.

#### A SIMPLE METHOD TO PROVE THE GENUINENESS OF THE RESINS OF JALAP AND SCAMMONIUM.

By A. BUCHNER.

The principal constituent part of the resin of jalap, rhodeoretin, which is insoluble in ether, according to the experiments of

Kayser and Wm. Mayer, is by the action of alkalies converted into an acid insoluble in water, to which was given the name of rhodeoretic acid. That part of the resin which is soluble in ether is changed the same way; for if the resin is dissolved under application of heat in diluted caustic potassa, and an excess of sulphuric or muriatic acid then added, the liquor will remain undisturbed, or become a little opalescent without any precipitate, according to the discoloration of the resin by charcoal.

On this property a method may be founded to prove the purity of the commercial resin of jalap by a single experiment, as the common adulterations, rosin, resins of guaiacum and agaric, are precipitated by acids from their alkaline solutions. A little of the resin is to be dissolved in diluted caustic potassa or soda, the solution heated, filtered, if necessary, and then diluted sulphuric acid added in excess. The pure resin, as stated above, will to the utmost produce a slight opalescence; an adulteration of but a very small quantity of a common resin will instantly form a thick resinous precipitate.

In this manner it cannot be detected, if the resin of the tubers of the genuine jalap be substituted by that of the spindle-shaped root of *Ipomæa (convolvulus) orizabensis*, which, according to Dr. Mayer, is acted upon analogous to rhodeoretin. But this is entirely and easily soluble in ether, the resin of the genuine jalap only to the smaller part.

Experiments made in my laboratory by Dr. Spirgatis, show that scammony, like rhodeoretin, by alkalies is changed into an acid, very soluble in water and therefore not precipitated by acids. The above method may also be adopted for the detection of adulterations of scammony with any of the common resins. The powdered scammony is heated with solution of potassa, filtered, and an excess of diluted sulphuric acid added. Genuine Aleppo scammony produces only an opalescence or a slight turbidness, but a considerable resinous precipitate will appear if the drug be adulterated with rosin or another of the common resins. The experiment will be still more satisfactory if the scammony is extracted with alcohol, the solution dissolved by shaking it with animal charcoal, filtered, evaporated and treated as above; for the alcoholic solution of the decolorized scammony, like that of the purified resin of jalap, is not affected by acids.—(*Buchner's Repertorium f. Pharm.* iii. 1.)



## ON STORAX BARK.

BY DANIEL HANBURY.

Among the drugs formerly imported from the Levant, is one now of rare occurrence, known in works on *Materia Medica* as *Cortex Thymiamatis*, *Cortex Thuris*, *Thus Judæorum* or *Nascaphtum*, and also by the names *Styrax rubra* or *Storax Bark*. Nothing satisfactory as to its origin has yet been ascertained: by some authors it is supposed to be the produce of *Styrax officinale*, Linn., after the expression of the resin, as related by Landerer, and when ground, to constitute the *Styrax calamita* of the shops; by other authors, it has been referred to *Liquidambar orientale*, Mill., or even to the American *L. styraciflua*, Linn.

Be this as it may, the bark of *Styrax officinale* as grown in France, is entirely dissimilar to the *Cortex Thymiamatis* of the Levant. When at Toulon in the month of May last, I had the pleasure of visiting in company with M. Chambeiron, an intelligent *pharmacien* and botanist of that town, one of the few localities in France where this beautiful plant is indigenous. In the mountainous woods on the east side of Toulon, in the direction of Cuers, the *Styrax* abounds. As it is cut periodically for fuel in common with the other trees growing near it, it can seldom attain any very considerable size; I observed no tree, I should say, exceeding eight or nine feet in height. At the moment of my visit (17th May, 1854) the *Styrax* trees were in full perfection, presenting with their abundance of orange-flower-like blossoms, a truly beautiful appearance. No trace of resinous exudation could I observe upon the trunk of any, nor did the fresh bark possess the least odor of storax. Of the bark, however, as the opportunity offered, I collected with the assistance of M. Chambeiron an abundant sample, taking it both from young and old wood. After it had been carefully dried by exposure to the air, it had assumed the form of tightly rolled quills; in this state it is externally smooth and of a dark greyish-brown, on its inner surface greenish; it is brittle, devoid of odor, and has a slightly bitter, non-aromatic taste. No odor of storax could be perceived upon heating the bark over a lamp.

The bark of *Styrax officinale* grown in France, is therefore a very different thing from the so-called *Storax Bark* of the Levant.



Whether the latter be really the produce of *Styrax officinale*, and the difference in the two be occasioned merely by climate, age of the trees, or other causes, further researches will, I trust, soon show. Landerer has asserted that the *Styrax* tree, inodorous in Greece, becomes fragrant at Cos and Rhodes, affording in these islands the resin *Storax* which is thence exported. But at Rhodes, at least, the trade in it must be very small indeed, as Mr. Niven Kerr, for many years H. B. M. Consul in that island, recently assured me he was wholly ignorant of it.—*Pharmaceutical Journal*.

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#### THE PREPARATION OF SUGAR OF MILK IN BAVARIA.

In the portion of the Bavarian Alps known under the name of Allgau, where Alpine industrial economy is worthily carried on, excellent cheese is not only made, which equals the best kinds of Swiss cheese, but in a recent period milk sugar has been also prepared there for medical purposes. The following is a description of the method by which the milk-sugar is manufactured. By means of rennet the caseine of the milk, heated to a certain temperature, is coagulated, and thus the cheese is obtained. For this purpose, either milk as it is, that is, such as still contains the butter, or such as has been churned to separate the butter, is taken. The latter affords less and poor cheese. From the former, the cheese is obtained fatty and good, in which the butter and cheese are intimately combined. Only a certain portion of butter remains behind in the residual liquid after the cheese has been separated. A little acid is mixed with the liquid, which causes the butter to separate and float on the surface as a scum, which is removed. The heating is continued, more acid added, and now a coagulum forms, which is skimmed off. From that which remains in the vessel, namely, the whey, the milk-sugar is made.

To purify the whey from accidental impurities, it is strained through a clean linen cloth into a well-tinned vessel, then boiled, and the scum constantly removed from its surface. Its evaporation is continued until when a spoonful of it is taken out, it does not pour away in fluid drops, but seems tenacious as a thin syrup. This mass is poured into a wooden vessel, and allowed to remain

therein two or three days, by which it becomes thick, feels sandy, exhibits a brown color, and tastes sweet. This mass is now purified by means of fresh spring water, which is poured in rather large quantities into the vessel; the mass is often stirred and then allowed to remain quiet for some time until it is deposited on the bottom of the vessel. The dirty water is then poured off and fresh added, and the dirty water poured away from time to time until a fine white powder is obtained. The first water poured off may be used for fattening pigs, and the latter ones, which have rather a white color, and contain much milk-sugar dissolved, are evaporated as the whey. The white powder is milk-sugar, and must be converted into certain forms. It is thus crystallized. The pure white powder is dissolved in boiling water, poured into a well-tinned vessel, and allowed to stand there for eleven to fourteen days. It forms fine crystalline sticks in the form of a cake. To obtain the crystals in the form of a sugar-loaf, wooden rods are introduced into the vessel about which the milk-sugar crystallizes. After the time named the sugar is taken out and dried, when it is fit for use.

The water remaining in the vessel is further evaporated, purified, and yields very fine milk-sugar, which is made into tablets by pouring moist powder on a wooden table covered with linen, allowing it to stand twelve hours, then cutting the mass into tablets and drying them.—*Annals of Pharm.*, July, 1854, from *Buchner's Repertorium*.

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#### ON A NEW PROCESS FOR PREPARING POWDER OF IRON.

BY ARTHUR MORGAN, L.A.C.

This preparation, known also as the “*Fer Reduit*,” or Quevenne’s iron, from the name of the gentlemen who introduced it, has obtained a place both in the last Dublin Pharmacopœia, and in that of the United States. On the continent, and in America, practitioners speak highly of its effects as a chalybeate and tonic; in this country its use has not been sufficiently extensive, as yet, to justify a decided opinion. I may mention, however, that in several cases in which it has been lately used at Sir Patrick Dun’s Hospital, its good effects were well marked.

In the formulæ which have been published in the two Pharma-

copœias already mentioned, the process is difficult and uncertain; it consists of passing a stream of hydrogen gas over oxide of iron, heated to redness, in an iron tube. The chief difficulty consists in regulating the heat, for if the heat is not sufficiently high the product will be a pyrophorous, taking fire immediately on exposure to the air; and, on the other hand, if the heat be too high, the powder will become agglutinated. These difficulties cause this preparation to fetch a high price, and afford temptations to the substitution of spurious imitations.

By the process which I propose, these difficulties are overcome, and an opportunity will be afforded of determining, by extensive use, whether the remedial effects of this preparation, justify its addition to our already overstocked *materia medica*.

To prepare powder of iron, according to my plan, the steps to be pursued are as follows:—

Eight ounces of yellow prussiate of potash are to be heated in an oven till the water of crystallization is driven off, reduced to a very fine powder, then thoroughly mixed with four ounces of red oxide of iron (previously well washed and finely pulverized), and three ounces of pure dried carbonate of potash. This mixture is then to be introduced (a small portion at a time) into a crucible previously heated to low redness. The heat must be kept up till all appearance of effervescence has ceased. The crucible is then allowed to cool, the mass scooped out, powdered, and having been introduced into a large bottle, repeatedly washed, by agitation and decantation, with distilled water, till the washings cease to precipitate with solution of nitrate of silver. The powder is then to be turned out on a filter and dried as rapidly, and with as little exposure to air, as possible. It may now, if necessary, be passed through a fine sieve, to separate any particles which may have agglutinated, owing to the application of too high a heat. The powder should be preserved in a well-stopped bottle. With this process, and the quantities mentioned, the product obtained will weigh about three ounces and a half.

As thus obtained the reduced iron is a fine powder, of a dark grey color, not feeling gritty or coarse under the fingers; it dissolves completely in muriatic acid, with considerable effervescence, and the solution thus obtained yields with potash or ammonia the greenish gelatinous precipitate indicative of a protosalt. If the precipitate be reddish, it shows the powder to contain oxide of

iron. Water digested on the powder should not precipitate with solution of nitrate of silver; that would indicate that all the cyanide of potassium had not been washed out.

The chemical decompositions which take place in this process I believe to be as follows:—Two atoms of ferrocyanide of potassium  $2 (2 \text{ K Cy} + \text{Fe Cy})$ , and two atoms of carbonate of potash  $2 (\text{KO}, \text{CO}_2)$  being fused together yield five atoms of cyanide of potassium  $5 (\text{K}, \text{Cy})$ , one atom of cyanate of potash  $(\text{KO} + \text{Cy}, \text{O})$ , two atoms of metallic iron, and two atoms of carbonic acid gas, which are given off in effervescence. The five atoms of cyanide of potassium thus formed now acting on three atoms and one-third of the peroxide of iron, decompose the peroxide, giving rise to five atoms of cyanate of potash  $5 (\text{KO}, \text{Cy}, \text{O})$ , and setting free the iron in a finely divided condition, thus we obtain all the iron contained in the materials used, both that of the ferro-cyanide and that of the peroxide.

The proportions in the process detailed above do not exactly agree with the atomic quantities just mentioned. According to the above explanation, the quantity of peroxide of iron required should be 2,144 grains instead of four ounces, or 1,750 grains, directed to be used. But as Wittstein has remarked (in speaking of Liebig's process for obtaining the mixed cyanide of potassium and cyanate of potash, by fusing ferrocyanide of potassium and carbonate of potash together in the proportions adopted in the process which has been detailed) that some of the cyanide is decomposed during the exposure to heat, the product, instead of being five atoms of cyanide of potassium to one atom of cyanate of potash, as by theory should be the result, consists of cyanide and cyanate in the proportion of seven of the former to five of the latter; it was therefore necessary to allow for this decomposition, and also further to reduce the amount of oxide used, so as to maintain a considerable excess of cyanide of potassium to protect the metal already reduced from oxidation by exposure to the heat and air.

This process, affording an easy and certain method of preparing an article which promises to be of some value as a therapeutic agent, and of obviating the use of a difficult and uncertain procedure, I have been induced to make known in the hopes that it may turn out of some value to the pharmaceutical chemist.—*Ann. of Pharm., July, 1854, from Dublin Medical Press.*

## THE MODE OF DISTINGUISHING QUININE FROM QUINIDINE.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

SIR,—Your last number contains a report of a lecture delivered at Liverpool (before the Liverpool Chemists' Association) by Dr. Nevins, in which the lecturer throws doubts upon the results obtained by previous observers with quinine and quinidine. The subject is not necessarily involved in obscurity, and in order to show the real origin of his difficulties I beg to submit a few observations.

It is difficult to adapt these experiments to a lecture-room ; for instance, to ascertain the extent to which sulphate of quinine is soluble in cold water requires some time. If the water is cold, the process of solution goes on extremely slowly when the solution is nearly saturated. Mr. Barry's plan is a better one : he heats the liquid till solution is effected, and then by cooling obtains a cold saturated solution, with a few minute feathers of crystallization. I think we must, therefore, leave the solubility of sulphate of quinine in water as it has been previously settled. A more important question is the tests for quinine and quinidine, founded upon their relative solubility in ether, or in water as sulphates.

Dr. Nevins appears to have taken as the material for his experiments a substance which was not pure quinidine. He found it soluble in ten parts of ether. No wonder, therefore, that the tests recommended by others failed or only partially succeeded. In order to obtain satisfactory results, we must have a pure article as the basis of experiments ; for this purpose quinidine should be crystallized twice out of ether ; and any one who will take the trouble to do this will find the old observations tolerably accurate.

It is much easier to obtain sulphate of quinine free from quinidine, than sulphate of quinidine free from quinine. Two or three crystallizations will leave the quinidine in the mother-liquors as the more soluble salt ; but if we now attempt to crystallize out the sulphate of quinidine, it will even after repeated crystallizations contain sulphate of quinine, a difficulty familiar enough to chemists in purifying a more soluble salt from a less soluble.

Consequently commercial sulphate of quinidine always contains some quinine more or less, or may happen to contain a good deal, though of course the manufacturer will not purposely sell the

more valuable article under the name of the cheaper. Even a small quantity of quinine will considerably alter the reactions of quinidine, especially as to solubility, and will of course give proportionate results under the microscope. But Dr. Nevins' results indicate so large a proportion of quinine, that I suspect some mistake somewhere. I am the more inclined to this opinion, because in procuring a sample of the make referred to (Messrs. Herrings, of Aldersgate Street), I found that  $\text{zij}$  of ether dissolved the precipitate from 1 gr., but did not quite dissolve it when 2 grs. were used; the solubility of this is therefore between 60 and 120 parts. This differs so widely from  $\text{zij}$  dissolving 15 grs., that I suspect that some sort of inferior sulphate of quinine must have been accidentally substituted.

Yours very respectfully,

ROBERT HOWARD.

Stratford, June 22d, 1854.

*Pharmaceutical Journal, July, 1854.*

## MANUFACTURE AND CONSUMPTION OF QUININE IN THE UNITED STATES.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

SIR,—Although Mr. Robert Howard has written a reply to the article under the above title, which appeared in your May number, yet I think there are still several points requiring notice, the original communication being full of errors.

Quinine was not originally classed in the list of free articles in the new American tariff, and subsequently excluded. The proposed tariff enumerates certain articles to be admitted free, and all others to pay an *ad valorem* duty of 25 or 100 per cent., thus abolishing the present great variety of duties. Quinine would thus come under the lowest duty of 25 per cent.—It now pays 20 per cent.; but it must not be forgotten that bark pays a duty of 15 per cent. There is no probability of the new tariff passing this year.

There are certainly only two manufacturers of quinine in the United States, but we have only two in England, and the same in France and Germany—each country giving a preference to its own manufactured article. Whether they are growing rich in the business depends very much on the skill and capital employed.



Jobst of Germany has not rejected the New Granada barks, nor can quinine, containing a certain percentage of quinine, be admitted into the United States. Foreign quinine rejected at New York has been on sale in the London market this spring. Quinine if intended to pass as quinine, must be pure.

There ought to be no question about the use of New Granada barks for the manufacture of quinine. Has there ever been an objection to the use of Carabaya bark? As Mr. Howard says, "The quinine contained in them is identical in all, from whatever species obtained." The monopoly of Bolivian bark has proved an universal blessing, by stimulating the importation of other kinds. What would have been the price of quinine if manufacturers had depended solely on the use of Bolivian bark?

We imported last year 17,000 serons of New Granada, and 1500 serons of Bolivian. The New Granada all sold; but the Bolivian, being held for a monopoly price, is still in the market, proving that this kind has very little demand.

Delondre, in his new work on quinine barks, gives an analysis of a New Granada bark containing quite as much quinine as Bolivian Calisaya. If the Calisaya of Santa Fe or Fusagasuga and Pitaya barks of New Granada had been introduced into the market before the Bolivian, there would be no question about the quality of the alkaloids they yield.

I am, yours obediently,

W. H. COLE.

16 George Street, Mansion House.

*Pharmaceutical Journal, July, 1854.*

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#### MANUFACTURE OF SULPHATE OF QUININE.

*Messrs. Thwaites' and Herapath's Patent (Enrolled May 15th, 1854.)*—The process is as follows:—112 lbs. of coarsely powdered Peruvian bark are first boiled for one hour or more in a solution of carbonate of soda, made by dissolving 28 lbs. of the carbonate in 56 gallons of water; the effect of this preliminary process is to remove much of the useless coloring and extractive matter of the bark. The bark is afterwards pressed, then thrown into a vat or tub, and well agitated with cold water; by this means, more of the coloring and extractive matter is removed. The bark is then collected on a strainer and expressed dry, after



which it is digested at about a temperature of  $100^{\circ}$  for one hour or more in a mixture of hydrochloric acid and water, formed by adding two fluid pints of acid to 50 gallons of water; in this acid mixture the bark is kept well agitated. After boiling for a quarter of an hour, the acid liquor is run off, and the bark strained. This digesting and boiling of the bark in acidulated water is repeated a second and a third time. The weak acid solutions from the second and third boilings are kept for the purpose of exhausting fresh portions of bark. The strong acid solutions are heated very gently with excess of cream of lime, by which the quinine, quinidine and cinchonine are thrown out of solution, and the liquor is allowed to cool.

To this mixture is then added fusel oil, turpentine, camphine, or other hydrocarbon insoluble in water and lighter than it; the patentees giving the preference to fusel oil, which is used in the proportion of one pint for each gallon of acid solution, and the solution of the alkaloids is assisted by well agitating the mixture. By this process the alkaloids (or some of them only, according to the solvent employed) are dissolved; and on repose, the solution will be found swimming on the top of the heavier watery fluid containing the chloride of calcium. The lighter fluid is then drawn off by means of a syphon, and repeatedly and thoroughly well agitated with a solution of six fluid ounces of sulphuric acid in fourteen gallons of water. By this process the alkaloids are transferred from the original solvent to the diluted sulphuric acid, and the quinine and other alkaloids become dissolved in the acid solution. The two fluids separate on repose in consequence of the great difference in the specific gravities, and should be separately syphoned off. The solvent having rendered up the alkaloids to the acid may again be used as a solvent for fresh portions of the alkaloids. The acid liquor containing the alkaloids in solution is now a concentrated mixed solution of sulphates of quinidine, quinine and cinchonine, with slight excess of sulphuric acid and some coloring matter. The solution is next decolorized by boiling with animal or vegetable charcoal, taking the necessary precautions to prevent any loss.

The solution is then divided into two equal parts, to one of which is added a solution of caustic soda or ammonia, or a solution of the carbonates of soda or ammonia, in quantity sufficient

to precipitate the alkaloids therein, without being employed in excess. The mixture is then added to the other half of the original solution, and boiled for one hour if necessary. If any grey alkaloid remains undissolved, dilute sulphuric acid is added cautiously, drop by drop; if crystals form during the boiling more water is added to dissolve them. This operation produces on cooling an abundant proportion of crystallized disulphate of quinine, mixed with some disulphate of quinidine, and usually some sulphate of cinchonine. Upon concentrating the solution by evaporation and then allowing it to cool, a large proportion of the two former substances may be recovered, and still more by a second and third repetition of the process of evaporation and crystallization. The produce of all these crystallizations being mixtures of the disulphates of the cinchona alkaloids, quinidine, and some cinchonine, should be purified by re-crystallization, or other process, in the usual manner, so as to render the article fit for the market. The quinine, quinidine and cinchonine remaining in the mother liquors, should be extracted by precipitation with a solution of caustic soda, ammonia, potassa, or other suitable precipitant, and then agitated with fusel oil, turpentine, camphene, or other solvent, as before described.

The dark brown-red alkaline fluid obtained by the preparatory process of boiling with an alkali, is now to be mixed with the liquid (containing chloride of calcium) from which the alkaloids have been obtained by agitating with a solvent, and the deeply-colored precipitated carbonate and other salts of lime and other impurities are allowed to subside, and should the liquid be still alkaline, or contain excess of carbonate of soda, a solution of chloride of calcium should be added to precipitate the carbonic acid as carbonate of lime, which must be separated. The liquid separated (still containing chloride of sodium, the hydrochlorates of quinine, and other cinchona alkaloids) is then concentrated by evaporation if necessary, and heated with slaked lime or cream of lime, and the precipitated alkaloid removed by the addition of fusel oil, turpentine, or other solvent, and the alkaloids separated as before described.

The proportions of alkali, acids, &c., above indicated are those for Peruvian bark of fair average quality.

The above process is also applicable, with certain modifications

named by the patentees, to the extraction of veratria and other alkaloids.

The patentees claim the use of fusel oil, camphene, turpentine or other hydrocarbons insoluble in water, in the manner described, for separating alkaloids from the liquid in which they are held in suspension or solution.

The above process of manufacturing quinine without alcohol appears to be similar to the undermentioned one.

*Messrs. Pelletier and Despretz's Process for the Manufacture of Sulphate of Quinine (Patented in England, July 25th, 1833.)* The principal object of the patentees is stated by them to be the production of sulphate of quinine, by means of *distilled or compressed oils*, whether derivable from *vegetable, animal or mineral substances*, or matter as a substitute for, and without the aid of, alcohol. They then describe the following mode of obtaining sulphate of quinine:—When distilled oil is intended to be used, the bark having been treated by acids, and the quinine and other matters soluble in the acid having been precipitated by means of lime, in the usual method of making quinine, the calcareous precipitate is dried and reduced to a fine powder; it is then treated several times with the oil intended to be used, in suitable vessels. The patentees prefer the use of oil of turpentine. The oil is then to be separated by decantation or filtration.

When expressed oil is used, care must be taken that the lime be first extracted, otherwise an insoluble lime soap would be formed.

The precipitate is then dissolved in an acid, and the rough quinine precipitated by ammonia; when in this state, it is treated with oil several times which will dissolve the quinine, and separate all foreign matters therefrom.

After obtaining the quinine in solution by expressed or distilled oils, the oil is treated by water acidulated with any acid capable of forming a salt with the quinine (preference given to hydrochloric acid,) the acidulated waters separate the quinine from the oil, the separation being easily effected by decantation, as the two liquids, having different specific weights, will not combine. The quinine thus dissolved is precipitated by an alkali, and after that it is reduced to sulphate by uniting it to sulphuric acid, care being taken to effect a complete saturation, and decolorize

the solution by means of animal charcoal; the sulphate is then crystallized by the method usually adopted.

There is another mode of separating the quinine when dissolved in distilled oils. This mode is by the application of heat in any of the known ways used in the separation of liquids; but the patentees consider this process less advantageous, and prefer treating the oil by acidulated water.—*Lond. Pharm. Jour.* 1854.

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#### ON THE PREPARATION OF INULINE.

By C. J. MIRAULT.

It is very difficult to obtain inuline from the root of *Inula* in a state of purity, if the root be treated with hot water and the inuline be allowed to settle after the concentration of the fluid. It is only after repeated treatment with charcoal that it can be obtained sufficiently white, and a good deal is thus lost by absorption in the charcoal.

It may however be readily obtained pure in the following manner:—A quantity of the root is exhausted by displacement with hot water, until a strong solution is obtained, which does not require too much evaporation; this is concentrated to 10 to 12 degrees of the areometer, when double its quantity of alcohol of spec. grav. 0.860 is added to it. The inuline is thrown down in a nearly white powder, which is dissolved afresh in a small quantity of distilled water; this solution is treated with bone-black, and again precipitated with the same quantity of alcohol; the precipitate is collected on a filter and dried, which now takes place very rapidly, as the fluid contains alcohol.

Although alcohol is employed in this process, it is still a very economical method, as but little of the alcohol is lost.—*London Chem. Gaz.* from *Journ. de Pharm. et de Chim.*, 3rd ser., xxv. p. 205.

# Varieties.

*On Perfumery.* By SEPTIMUS PIESSE.

(Continued from page 374.)

LILY.—The manufacturing perfumer rejects the advice of Solomon, to “consider the lilies of the field.” Rich as they are in odor they are not cultivated for their perfume. If lilies are thrown into oil of sweet almonds, or olive oil, they impart to it their sweet smell; but to obtain anything like fragrance the infusion must be repeated a dozen times with the same oil, using fresh flowers for each infusion, after standing a day or so. The oil being shaken with an equal quantity of spirit for a week gives up its odor to the alcohol, and thus extract of lilies may be made. But how it is made is thus:—

## IMITATION “LILY OF THE VALLEY.”

Extract of tubereuse . . . . .	½ pint.
Extract of jasmin . . . . .	1 oz.
Extract of fleur d’orange . . . . .	2 oz.
Extract of vanilla . . . . .	3 oz.
Extract of cassie . . . . .	¼ pint.
Extract of rose . . . . .	¼ pint.
Hydrocyanic acid . . . . .	3 drops.

Keep this mixture together for a month, and then bottle it for sale. It is a perfume that is very much admired.

MAGNOLIA.—The perfume of this flower is superb; practically, however, it is of little use to the manufacturer, the large size of the blossoms and their comparative scarcity\* prevents their being used, but a very excellent imitation of its odor is made as under, and is that which is found in the perfumers’ shops of London and Paris.

## IMITATION “ESSENCE OF MAGNOLIA.”

Spirituos extract of orange flower pomatum . . . . .	1 pint
Spirituos extract of rose pomatum . . . . .	2 pints
Spirituos extract of tubereuse pomatum . . . . .	½ pint
Spirituos extract of violet pomatum . . . . .	½ pint
Essential oil of citron . . . . .	2 drams
Essential oil of almonds : . . . .	10 drops

MACE.—Ground mace is used in the manufacture of some of those scented powders called Sachets. A strong-smelling essential oil may be procured from it by distillation, but is rarely used.

MARJORAM.—The essential oil procured by distilling *Origanum marjorana*,

\* [This remark does not apply to the United States.—ED. AM. JOURN. PHARM.]

commonly called oil of oringeat by the French, is exceedingly powerful, and in this respect resembles all the oils from the different species of thyme, of which the marjorum is one. One hundred weight of the dry herb yields about ten ounces of the essential oil. Oringeat oil is extensively used for perfuming soap, but more in France than in England. It is the chief ingredient used by Gelle Frères, of Paris, for scenting their "Tablet Monstre Soap," so common in the London shops.

MELISSA. See BALM.

MEADOW SWEET.—A beautiful smelling oil can be produced by distilling the *Spiraea ulmaria*, but is not used by perfumers.

MIGNONETTE.—But for the exquisite odor of this little flower, it would scarcely be known otherwise than as a weed. Sweet as it is in its natural state, and prolific in odor, we are not able to maintain its characteristic smell as an essence. Like many others, during separation from the plant, the fragrance is more or less modified. Though not perfect, it still reminds the sense of the odor of the flowers. To give it that sweetness which it appears to want, a certain quantity of violet is added to bring it up to the market odor. As this plant is so very prolific in odor, we think something might be done with it in England, especially as it flourishes as well in this country as in France.

What we desire to see are flower farms and organized perfumatories established in the British Isles, for the extraction of essences and the manufacture of pomade and oils, of such flowers as are indigenous, or that thrive in the open fields of our country. Besides opening up a new field of enterprise and good investment for capital, it would give healthy employment to many women and children. Open-air employment for the young is of no little consideration to maintain the stamina of the future generation; for it cannot be denied that our factory system and confined cities are degenerative to the physical condition of the human family.

To return from our digression. The essence of mignonette, or, as it is more often sold under the name of, *extrait de rézeda*, is prepared by infusing the *rézeda* pomade in rectified spirit, in the proportion of one pound of pomade to one pint of spirit, allowing them to digest together for a fortnight, when the essence is filtered off the pomade. One ounce of *extrait d'ambré* is added to every pint. This is done to give permanence to the odor upon the handkerchief, and does not in any way alter its odor.

MYRTLE.—A very fragrant, essential oil may be procured by distilling both the flowers and the leaves of the common myrtle; one hundred weight will yield about five ounces of the volatile oil. The demand for essence of myrtle being very limited, the odor as found in the perfumers' shops is very rarely a genuine article, but is imitated thus:—

Extract of vanilla	.	.	.	.	.	$\frac{1}{2}$ pint.
" roses	.	.	.	.	.	1 pint.
" fleur d'orange	.	.	.	.	.	$\frac{1}{2}$ pint.
" tubereuse	.	.	.	.	.	$\frac{1}{2}$ pint.
" jasmin	.	.	.	.	.	2 ounces.

Mix and allow to stand for a fortnight: it is then fit for bottling, and is a perfume that gives a great deal of satisfaction.

Myrtle-flower water is sold in France under the name of eau d'ange, and may be prepared like rose, elder, or other flower waters.

MINT.—All the *menthidae* yield fragrant oils by distillation. The oil of the spear-mint (*M. viridis*) is exceedingly powerful, and very valuable for perfuming soap, in conjunction with other perfumes. Perfumers use the oils of the mint in the manufacture of mouth washes and dental liquids. The leading ingredient in the celebrated "eau botot" is oil of peppermint in alcohol. A good imitation may be made thus:—

Tincture of cedar wood	.	.	.	.	1 pint.
“ myrrh	.	.	.	.	1 oz.
Oil of peppermint	.	.	.	.	$\frac{1}{2}$ dr.
“ spear mint	.	.	.	.	$\frac{1}{4}$ dr.
“ cloves	.	.	.	.	10 drops.
“ roses	.	.	.	.	10 drops.

Modifications of this formula can be readily suggested, but the main object is to retain the mint oils, as they have more power than any other aromatic to overcome the smell of tobacco. Mouth washes, it must be remembered, are as much used for rinsing the mouth after smoking as for a dentifrice.

NEROLI, OR ORANGE-FLOWER.—Two distinct odors are procurable from the orange blossom, varying according to the methods adopted for procuring them. This difference of perfume from the same flower is a great advantage to the manufacturer. It is a curious fact, and is worthy of inquiry by the chemical philosopher. It is not singular to the orange-flower, but applies to many others, especially rose—probably to all flowers.

When orange-flowers are treated by the maceration process, that is, by infusion in a fatty body, we procure orange flower pomatum, its strength and quality being regulated by the number of infusions of the flower made in the same grease. By digesting this orange-flower pomatum in rectified spirits in the proportions of from six pounds to eight pounds of pomade to a gallon of spirit for about a fortnight at a summer heat, we obtain the "extrait de fleur d'orange," or extract of orange-flowers, a handkerchief perfume surpassed by none. In this state its odor resembles the original so much, that with closed eyes the best judge could not distinguish the scent of the extract from the flower. The peculiar flowery odor of this extract renders it valuable to the perfumers, not only to sell in a pure state, but slightly modified with other *extraits* passes for "sweet pea," "magnolia," &c., which it slightly resembles in fragrance.

Now, when orange-flowers are distilled with water, we procure the essential oil of the blossom, which is known commercially as oil of neroli. The neroli procured from the flowers of the citrus aurantium is considered to be the finest quality, and is called "neroli petale." The next quality, "neroli



bigarrade," is derived from the blossoms of the *Citrus bigaradia*, or Seville orange. Another quality, which is considered inferior to the preceding, is the neroli petit grain, obtained by distilling the leaves and the young unripe fruit of the different species of the citrus.

The petale and bigarade neroli are used to an enormous extent in the manufacture of eau de Cologne and other handkerchief perfumes. The petit grain is mainly consumed for scenting soap. To form the esprit de neroli, dissolve  $1\frac{1}{2}$  oz. of neroli petale in one gallon of rectified spirits. Although very agreeable, and extensively used in the manufacture of bouquets, it has no comparison to the flowery odor of the extrait de fleur d'orange as derived from the same flowers by maceation; in fact, it has as different an odor as though obtained from another plant, yet in theory both these extracts are but alcoholic solutions of the essential oil of the flower.

The water used for distillation in procuring the neroli, when well freed from the oil, is imported into this country under the name of eau de fleur d'orange, and may be used like elder-flower and rose water, for the skin and as an eye lotion. It is remarkable for its fine fragrance, and it is astonishing that it is not more used, being moderate in price.

NUTMEG.—The beautiful odor of the nutmeg is familiar to all. Though an essential oil can be drawn from them of a very fragrant character, it is rarely used in perfumery. The ground nuts are, however, used beneficially in the combinations of scented powders used for scent bags.—See "Sachet's Powders."

ORANGE.—Under the title "Neroli" we have already spoken of the odoriferous principle of the orange blossom. We have now to speak of what is known in the market as essential oil of orange, or, as it is more frequently termed, essence of Portugal, a name, however, which we cannot admit in a classified list of the "odors of plants."

The oil, or odoriferous principle of the orange fruit, is procured by expression and by distillation. The peel is rasped in order to crush the little vessels or sacs that imprison the oil.

Its abundance in the peel is shown by pinching a piece near the flame of a candle; the true essential oil that spurts out ignites with a brilliant illumination.

It has many uses in perfumery, and from its refreshing fragrance finds many admirers.

It is the leading ingredient in what is sold as "Lisbon water" and "eau de Portugal." The following is a very useful form for preparing

#### LISBON WATER.

Rectified spirit (not less than 60 over proof)	.	1 gallon.
Essential oil of orange peel	. . . .	3 oz.
"    "    lemon peel	. . . .	3 oz.
"    "    otto of rose	. . . .	$\frac{1}{4}$ oz.

This is a form for—

## EAU DE PORTUGAL.

Rectified spirit (60 over proof).	.	.	.	1 gallon.
Essential oil of orange peel	.	.	.	6 oz.
“ “ lemon peel	.	.	.	1 oz.
“ “ lemon grass	.	.	.	$\frac{1}{4}$ oz.
“ “ bergamot	.	.	.	1 oz.
“ “ otto of rose	.	.	.	$\frac{1}{4}$ oz.

It should be noted that these perfumes are never to be filled into wet bottles, for if in any way damp from water, a minute portion of the essential oils are separated, which gives an opalescent appearance to the mixture. Indeed, all bottles should be *spirit rinsed* prior to being filled with any perfume, but especially with those containing essences of orange or lemon peel.

OLIBANUM is a gum resin, used, to a limited extent in this country, in the manufacture of incense and pastilles. It is chiefly interesting as being one of those odoriferous bodies of which frequent mention is made in the Holy Volume.

“It is believed to have been one of the ingredients in the sweet incense of the Jews; and it is still burnt as incense in the Greek and Romish churches, where the diffusion of such odors round the altar form a part of the prescribed religious service.”—BURNETT.

Olibanum is partially soluble in alcohol, and has an odor similar to tolu and benzoin, and, like most of the balsams, probably owes its perfume to the benzoic acid it contains, slightly modified by the presence of a small portion of a peculiar essential oil.

For making the tincture or extract of olibanum, take 1 pound of the gum to 1 gallon of the spirit.

ORRIS PALM.—The odor of palm oil—the fat oil of commerce—is due to a fragrant principle which it contains. By infusion in alcohol, the odoriferous body is dissolved, and resembles, to a certain extent, the tincture of orris, or of extract of violet, but is very indifferent, and is not likely to be brought into use, though several attempts have been made to render it of service when the cultivation of the violets have failed from bad seasons.

ORRIS, properly IRIS.—The dried rhizome of *Iris Florentina* has a very pleasant odor, which, for the want of a better comparison, is said to resemble the smell of violets; it is, however exceedingly derogatory to the charming aroma of that modest flower when such invidious comparisons are made. Nevertheless the perfume of iris root is good, and well worthy of the place it has obtained as a perfuming substance. The powder of orris root is very extensively used in the manufacture of sachet powders, tooth powder, &c. It fathers that celebrated “oriental herb” known as “Odonto.” For tincture of orris, or, as perfumers call it,

## EXTRACT OF ORRIS,

Take orris root, crushed	.	.	.	7 lbs.
Rectified spirits	.	.	.	1 gallon.

After standing together for about a fortnight, the extract is fit to take off. It requires considerable time to drain away, and, to prevent loss, the remainder of the orris should be placed in the tincture press. This extract enters into the composition of many of the most celebrated bouquets, such as 'Jockey Club,' and others, but is never sold alone, because its odor, although grateful, is not sufficiently good to stand public opinion upon its own merits; but in combination its value is very great; possessing little aroma itself, yet it has the power of strengthening the odor of other fragrant bodies; like the flint and steel, which, though comparatively incombustible, readily fire inflammable bodies.

**PATCHOULY.**—*Pogostemon Patchouly* (LINDLEY,) *Plectranthus crassifolius* (BURMETT,) is an herb that grows extensively in India and China. It somewhat resembles our garden sage in its growth and form, but the leaves are not so fleshy.

The odor of patchouly is due to an essential oil contained in the leaves and stems, and is readily procured by distillation. 1 cwt. of good herb will yield about 28 oz. of the essential oil, which is of a dark brown color, and of a density about the same as that of oil of sandal wood, which it resembles in its physical character. Its odor is the most powerful of any derived from the botanic kingdom; hence, if mixed in the proportion of measure for measure, it completely covers the smell of all other bodies.

#### EXTRACT OF PATCHOULY.

Rectified spirit	.	.	.	.	.	.	1 gallon.
Oil of patchouly	.	.	.	.	.	:	1 $\frac{1}{4}$ oz.
Otto of rose	.	.	.	.	.	.	$\frac{1}{4}$ oz.

The essence of patchouly thus made is that which is found in the perfumers' shops of Paris and London. Although few perfumes have had such a fashionable run, yet when smelled at in its pure state it is far from agreeable, having a kind of mossy or musty odor, analogous to Lycopodium, or some folk say it smells of "old coats."

The characteristic smell of Chinese or Indian ink is due to some admixture of this herb.

The origin of the use of patchouly as a perfume in Europe is curious. A few years ago real Indian shawls bore an extravagant price, and purchasers could always distinguish them by their odor; in fact, they were perfumed with patchouly. The French manufacturers had for some time successfully imitated the Indian fabric, but could not impart the odor. At length they discovered the secret, and began to import the plant to perfume articles of their make, and thus palm off home-spun shawls as real Indian! From this origin the perfumers have brought it into use. Patchouly herb is extensively used for scenting drawers in which linen is kept; for this purpose it is best to powder the leaves and put them into muslin sacks, covered with silks, after the manner of the old-fashioned lavender bag. In

this state it is very efficacious in preventing the clothes from being attacked by moths. Several combinations of patchouly will be given in the recipes for "bouquets and nosegays."

PEA (SWEET).—A very fine odor may be abstracted from the flowers of the chick-vetch by maceration in any fatty body, and then digesting the pomade produced in spirit. It is, however, rarely manufactured, because a very close IMITATION of the ESSENCE OF SWEET PEA can be prepared thus :—

Extract of tuberose	.	.	.	.	.	$\frac{1}{2}$ pint.
" " fleur d'orange :	.	.	.	.	.	$\frac{1}{2}$ pint.
" " rose from pomatum	.	.	.	.	.	$\frac{1}{2}$ pint.
" " vanilla	.	.	.	.	.	1 oz.

Scents, like sounds, appear to influence the olfactory nerve in certain definite degrees. There is, as it were, an octave of odors like an octave in music; certain odors coincide, like the keys of an instrument. Such as almond, heliotrope, vanilla, and orange blossom blend together, each producing different degrees of a nearly similar impression. Again, we have citron, lemon, orange peel, and verbena, forming a higher octave of smells, which blend in a similar manner. The metaphor is completed by what we are pleased to call semi-odors, such as rose and rose geranium for the half note; petty grain, neroli a black key, followed by fleur d'orange. Then we have patchouly, sandal wood, and vitivert, and many others running into each other.

From the odors already known we may produce, by uniting them in proper proportion, the smell of almost any flower.

The odor of some flowers resembles others so nearly, that we are almost induced to believe them to be the same thing, or, at least, if not evolved from the plant as such, to become so by the action of the air-oxidation. It is known that some actually are identical in composition, although produced from totally different plants, such as camphor, turpentine, rosemary. Hence we may presume that chemistry will sooner or later produce one from the other, for with many it is merely an atom of water or an atom of oxygen that causes the difference. It would be a grand thing to produce otto of roses from oil of rosemary, or from the rose geranium oil, and theory indicates its possibility.

The essential oil of almonds in a bottle that contains a good deal of air-oxygen, and but a very little of the oil, spontaneously passes into another odoriferous body, benzoic acid; which is seen in crystals to form over the dry parts of the flask. This is a natural illustration of this idea. In giving the recipe for "sweet pea" as above, we form it with the impression that its odor resembles the orange blossom, which similarity is approached nearer by the addition of the rose and tuberose. The vanilla is used merely to give permanence to the scent on the handkerchief, and this latter body is chosen in preference to extract of musk or ambergris, which would



It is remarkable how very much this mixture resembles the odor of the flower, and the public never doubt its being the "real thing."

ROSE.—

"Go, crop the gay rose's vermeil bloom,  
And waft its spoils, a sweet perfume,  
In incense to the skies."—OGILVIE.

This queen of the garden loses not its diadem in the perfuming world. The oil of roses, or, as it is commonly called, the otto, or attar, of roses, is procured (contrary to so many opposite statements) simply by distilling the roses with water.

The otto of rose of commerce is derived from the *Rosa centifolia provincialis*. Very extensive rose farms exist at Adrianople (Turkey in Europe,) at Broussa, now famous as the residence of Abd-el-Kader; and at Uslak (Turkey in Asia;) also at Ghazepore, in India.

The cultivators in Turkey are principally the Christian inhabitants of the low countries of the Balkan, between Selimno and Carloya, as far as Philipopolis, in Bulgaria, about 200 miles from Constantinople. In good seasons, this district yields 75,000 ounces; but in bad seasons only 20,000 to 30,000 ounces of attar are obtained. It is estimated that it requires at least 2,000 rose blooms to yield one drachm of otto.

The otto slightly varies in odor from different districts; many places furnish an oil which solidifies more readily than others, and, therefore, this is not a sure guide of purity, though many consider it such. That which was exhibited in the Crystal Palace of 1851, as "from Ghazepore," in India, obtained the prize. Pure otto of roses, from its cloying sweetness, has not many admirers; when diluted, however, there is nothing to equal it in odor, especially if mixed in soap, to form rose soap, or in pure spirit, to form the esprit de rose. The soap not allowing the perfume to evaporate very fast, we cannot be surfeited with the smell of the otto.

The finest preparation of rose as an odor is made at Grasse, in France. Here the flowers are not treated for the otto, but are subjected to the process of maceration in fat, or in oil, as described under jessamine, heliotrope, &c.

The rose pomade thus made, if digested in alcohol, or pure uncolored, unsweetened brandy, yields an "esprit de rose" of the first order, very superior to that which is made by the addition of otto to spirit. It is difficult to account for this difference, but it is sufficiently characteristic to form a distinct odor. See the articles on fleur d'orange and neroly (pp. 462, 463), which have similar qualities, previously described. The esprit de rose made from the French rose pomade is never sold retail by the perfumer; he reserves this to form part of his *recherché* bouquets.

Some wholesale druggists have, however, been selling it now for some time to country practitioners, for them to form extemporaneous rose-water, which it does to great perfection. Roses are cultivated to a large extent in England, near Mitcham, in Surrey, for perfumers' use, to make rose-water. In the season when successive crops can be got, which is about the end of

June, or the early part of July, they are gathered as soon as the dew is off, and sent to town in sacks. When they arrive, they are immediately spread out upon a cool floor; otherwise, if left in a heap, they heat to such an extent, in two or three hours, as to be quite spoiled. There is no organic matter which so rapidly absorbs oxygen, and becomes heated spontaneously, as a mass of freshly-gathered roses. To preserve these roses, the London perfumers immediately pickle them; for this purpose, the leaves are separated from the stalks, and to every bushel of flowers, equal to about six pounds weight, one pound of common salt is thoroughly rubbed in. The salt absorbs the water existing in the petals, and rapidly becomes brine, reducing the whole to a pasty mass, which is finally stowed away in casks. In this way they will keep almost any length of time, without the fragrance being seriously injured. A good rose water can be prepared by distilling 12 lbs. of pickled roses, and  $2\frac{1}{2}$  gallons of water. "Draw" off two gallons; the product will be the double-distilled rose-water of the shops. The rose-water that is imported from the south of France is, however, very superior in odor to any that can be produced here. It has a richness of aroma which appears to be inimitable with English grown roses. There are four modifications of essence of rose for the handkerchief, which are the *ne plus ultra* of the perfumer's art. They are—esprit de rose triple, essence of white of roses, essence of tea rose, and essence of moss rose. The following are the recipes for their formation:—

## ESPRIT DE ROSE TRIPLE.

Rectified alcohol	. . . . .	1 gallon.
Otto of rose	. . . . .	3 oz.

Mix at a summer heat; in the course of a quarter of an hour the whole of the otto is dissolved, and is then ready for bottling and sale. In the winter season beautiful crystals of the otto—if it is good—appear disseminated through the esprit.

## ESSENCE OF MOSS ROSE.

Spirituous extract from French rose pomatum	. . . . .	1 quart.
Esprit de rose triple	. . . . .	1 pint.
Extract fleur d'orange pomatum	. . . . .	1 pint.
" of ambergris	. . . . .	$\frac{1}{2}$ pint.
" of musk	. . . . .	4 oz.

Allow the ingredients to remain together for a fortnight; then filter, if requisite, and it is ready for sale.

## ESSENCE OF WHITE ROSE.

Esprit de rose from pomatum	. . . . .	1 quart.
" de rose triple	. . . . .	1 quart.
" de violette	. . . . .	1 quart.
Extract of jessamine	. . . . .	1 pint.
" patchouly	. . . . .	$\frac{1}{2}$ pint.



## ESSENCE OF TEA ROSE.

Esprit de rose pomade	.	.	.	.	.	.	1 pint.
" de rose triple	.	.	.	.	.	.	1 pint.
Extract of rose leaf geranium	.	.	.	.	.	.	1 pint.
" sandal wood	.	.	.	.	.	.	$\frac{1}{2}$ pint.
" neroli	.	.	.	.	.	.	$\frac{1}{4}$ pint.
" orris	.	.	.	.	.	.	$\frac{1}{4}$ pint.

*Annals of Pharmacy.*

*Gallic Acid in Night-sweats of Phthisis.*—Under the usual treatment of phthisis, (full diet, cod-liver oil, and tonics,) the tendency to night-perspiration often ceases spontaneously. If it becomes desirable to expedite the process, it may be done by the sesquichloride of iron, the mineral acids, or, best of all, by the gallic acid. The following is the prescription for a night-draught containing the latter:

R. Acidi gallici. gr. vij.; morph. acet. gr.  $\frac{1}{2}$ ; alcohol q. s. (a few drops); syr. tolutan. ʒss.; aquæ ʒj.

The night-pill, as we find in the Pharmacopœia of the Brompton Hospital for Consumption, is—

R. Acid. gallic. gr. v.; morph. hydrochl. gr.  $\frac{1}{2}$ ; mist. acac. q. s. Ft. pil. ij.

It is also of advantage to adopt an astringent regimen as far as convenient. The patient should be directed to sleep on a mattress, alone, and not heavily clothed; he should wear no flannel in bed; as dry a diet should be taken as conveniently can be borne, and fluid should be especially avoided in the latter half of the day, none whatever being allowed later than several hours before bed-time.—*Southern Medical and Surgical Journal*, August, 1854, from *London Med. Times*.

*Mammoth Trees of California.*—An article in the *Sonora Herald* of August 27, 1853, contained the following statements respecting the Mammoth Trees of California, one of which was the subject of Prof. Gray's remarks in the last volume of this Journal. The tree that has been cut down was 95 feet in circumference at the ground, and 300 feet high. Another tree is lying near by, now dead. It is decayed within, and contains a cavity which for 250 feet of its length averages 10 or 12 feet in height; so that a man may enter it on horseback and ride the whole distance. From its diameter near its base, its circumference was estimated at 110 feet, and it was judged to have been near 400 feet high. Another tree still standing has a circumference near the ground of 97 feet, its height 350 feet. Not far distant there is a trio of trees, the united circumference 92 feet, and height 300, the middle one rising 200 feet without a branch. In the same neighborhood there is a twin tree, with a circumference of 90 feet; the trunks of the two parts are joined for 10 feet; the height is 325 feet. A single tree of perfect symmetry, is 92 feet in circumference, and 350 feet high. There are 85 of these mammoth trees scattered

over an area of 50 acres. The soil of this Mammoth Grove is moist and rich.—*American Journal of Science and Arts*.

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*Mode of Using Bi-sulphate of Soda as a Substitute for Cream of Tartar and Alum.*—The use of this substitute in the dyeing of woollen goods is becoming more general every day, in consequence of the saving of nearly one hundred per cent. effected by it. The colors in the preparations of which it has hitherto been employed are chrome-black, chrome brown, grey, all fancy colors, green, carmine, blue. A decoction made in four pounds of the bi-sulphate has the same effect as four pounds of alum and two pounds of tartar; in the dyeing of some colors some alum is, however, still employed. For every fifty pounds of wool to be dyed of a chrome-black, one pound of chromate of potash and one-half pound of the substitute are required. The wool is to be introduced at a temperature of 190° F., then boiled for fifty minutes, and dyed in a fresh bath of Brazil wood, containing, according to the shade, one-quarter to one-half pound of the dye-wood. To dye the same quantity of wool of a chrome-brown, one pound of chromate of potash, one and one-half pounds of substitute and half a pound of alum are employed. The wool is boiled for one hour, and then dyed in a bath of logwood; or for a yellowish brown and bronze shade, in a bath composed of fustic, Brazil wood and logwood in certain proportions. In the dyeing of green some add alum to the substitute, and throw the substitute, in the proportion of half a pound to ten pounds of wool, directly into the dye-bath, omitting altogether the previous boiling.—*Deutsche Musterzeitung*, No. 6, 1853.

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*Method of Communicating a Dull Black Color to Brass.*—According to M. Leykauf, a dull black color, such as is frequently employed for optical instruments, may be given to brass, by first carefully rubbing the object with tripoli, then washing it with a very dilute solution of a mixture of one part of neutral nitrate of tin and two parts of chloride of gold, and then wiping off the excess of liquid, after the lapse of ten minutes, with a wet cloth. If there has been no excess of acid, the surface of the metal will have assumed a dark black color. The neutral nitrate of tin may be prepared by decomposing the perchloride with ammonia, and dissolving the precipitated oxide thus obtained in nitric acid.—*Le Technologiste*.

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*On the Detection of Strychnine in Saccharine Powders.* By A. VOGEL, Jun.—Otto has recommended bichromate of potash as a test for strychnine. The substance to be tested is mixed with the finely-powdered salt, and then moistened with sulphuric acid; a dark violet color is produced. Brieger states that strychnine mixed with sugar cannot be discovered in this way. The author says that in this case the substance to be tested must first be moistened with sulphuric acid, and the salt afterwards added to it. By adopting this plan, moreover, the reaction is not prevented either by quinine, cinchonine, starch or dextrine.—*Buchner's Neues Repert.*, ii. p. 560.

*On a Modification of VOGEL'S Test for Quinine.* By M. VON KLITZINSKY.  
—Vogel's test does not always indicate quinine with certainty in organic fluids, as for instance in the urine. Under such circumstances the quinine must first be separated by an excess of calcined magnesia and evaporating the fluid therewith to dryness; the residue is extracted with a mixture of 1 part of alcohol and 2 parts of ether, and this extract evaporated to dryness, and the alkaloid extracted from it by means of ether. The ether now leaves tolerably pure quinine, which allows the reactions of the following series of operations to be recognized with more certainty.

Boiling water is saturated with ferridecyanide of potassium (instead of the ferrocyanide according to Vogel), and to the solution whilst still hot five times its quantity of the strongest solution of chloride is added; ammonia is then added to the blackish-green solution until it has a strong alkaline reaction; it is then filtered from the brown flakes of hydrated peroxide of iron which separate. This test-fluid cannot be kept long. The fluid to be tested for quinine is first mixed with an excess of solution of chlorine; the re-agent is then dropped in, when the presence of quinine is indicated by the production of a beautiful blood-red or violet color.—*Buchner's Neues Rep.*

*Test for Manganese*—As a test for very small quantities of manganese, E. Davy recommends that a few drops of a solution of caustic potash, in an equal quantity of water, should be placed on the manganese compound in a finely pulverized condition, and the mixture heated to redness on silver foil, by which means the well known green coloration is obtained. If the manganese compound is in a state of solution, the solution of potash must be added to it on the silver foil. Ferrocyanuret of iron is also a very delicate test. Equal parts of sulphur and the manganese compound are heated to redness on platinum foil, dissolved in water, and the filtrate mixed with the cyanide, which produces a white precipitate.—*London Ann. of Pharm.*

*New Mode of administering Cod Liver Oil.*—M. Sauvan gives the following formula for administering cod-liver oil, by which, he says, the taste and odor of the oil is completely masked:

R.	Yolk of egg	.	.	.	.	No. 1,
	Sugar	.	.	.	.	60 grammes,
	Orange-flower water	.	.	.	.	30 "
	Cod-liver oil	.	.	.	.	90 "
	Essence of bitter almonds	.	.	.	.	1 drop.

*Med. News, from Ann. Cliniq. de Montpellier.*

*Oil of Wormseed.*—According to the investigations of C. Volckel, the chief constituent of this oil is an oil which boils at 347° Fahr. When purified with caustic potash, it has a specific gravity of .919, is readily soluble in alcohol and ether, and has the composition  $C_{12}H_{10}O$ . The other oil, mixed with this oil, cannot be obtained pure, but it contains more oxygen than the previous one.—*London Ann. of Pharm., from Annalen der Chemie.*

## Editorial Department.

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THE LATE MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.—The limited attendance of the members at Cincinnati is a source of regret, yet the moral effect of holding a meeting so far from the previous localities, and the excellent spirit which prevailed, is cause for encouragement to those who feel an interest in this movement. The extensive prevalence of epidemic cholera was the chief cause of the absence of the eastern members, and a misunderstanding of the time of meeting caused a number of western pharmacutists to arrive too late.

At the commencement of this number we have given a connected account of the transactions of the Association, from notes taken at the time, which will render any notice of them here unnecessary. We cannot let the opportunity pass without recording an acknowledgment of the hospitality and kindness of our friends of the Cincinnati College of Pharmacy. On the evening of the 27th of July the members of the Association and others sat down to an elegant entertainment at the Burnett House, at which several prominent members of the medical profession—Prof. Lawson, Prof. Mendenhall and others—were present. The fare was excellent, the spirit that prevailed in excellent keeping, and after a free interchange of sentiment, the company parted with an improved feeling of interest in each other and for the objects of the Association.

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PROCEEDINGS OF THE MASSACHUSETTS COLLEGE OF PHARMACY.—We have received a copy of the proceedings of this College, at their annual meeting, at Boston, March 6th, 1854, and have been so favorably impressed with the importance of some of the measures brought forward, as to reprint the Report on the present condition of that Institution, viz :

They find the College to be in good condition in regard to members, finances, locality, and its executive government, but that a want of interest exists in its members individually to avail themselves of its privileges, which detracts from the usefulness designed to be extended by its organization.

At the time of its re-organization, about three years since, the old roll of members was in use. Many of them had given up their interest in the Drug Business, or did not wish to continue active members, or had withdrawn from the College just previous to, or during its quiescent state; but it has been the policy of the government to keep as many of the old members as possible. The roll now numbers ninety-four, though we count but seventy-two as active members. The records show fifty-five admissions of new members, and six honorary members. Out of Boston, in other parts of New England, the number of members admitted has been twenty-two. One death only has occurred. Great pains have been taken to investigate the character and professional standing of its distant members, and no member has been admitted unless the Board have received positive assurances of his qualifications. In consequence of this course, several

applications are now before the Board, not definitely acted upon, for want of such assurances.

The property of the College has materially increased, besides paying its expenses, and furnishing its present desirable accommodations. It has accumulated property to the amount of between six and seven hundred dollars; its Library contains, besides pamphlets and periodicals, two hundred and seventy-seven volumes, some of which are old, rare, and valuable. It contains a perfect set of sixty-four volumes of Silliman's Journal of Arts and Sciences; also a full set of twenty-five volumes, of the American Journal of Pharmacy (another set of which could not now be obtained), and a valuable set of colored Botanical Medical Plates. A cabinet has been commenced, and now contains some valuable specimens; the bottles and labels have been furnished by the College, to make a uniform set, but the samples have been contributed gratuitously by persons in and out of the association.

A statement of what the Board of Trustees have done, may be condensed as follows. Furnishing rooms, making addition to Library and cabinet, procuring a very favorable charter from the Legislature, with power to hold real estate, and create transferable stock; collecting pharmaceutical statistics of New England, and co-operating with the American Pharmaceutical Association; providing Lectures, admitting members, managing the financial affairs, and in the general attendance to the business of the College since its re-organization.

But your committee would state, that in consequence of a want of interest manifested by the profession, the plans of the Board have as yet been imperfectly carried out. It is true our Ethics well and clearly define the duties and responsibilities of our profession; but the object of the College aims at a much greater state of perfection in the practice of Pharmacy, much more elevated scientific attainments on the part of its members, and a more thorough education of apprentices.

The past winter the Board made arrangements for a course of Lectures on Chemistry, by a professor every way qualified to take rank in any institution of the kind. The course was prepared expressly for this college, with reference to this branch of our profession, and was intended as a trial, to be followed by other courses, on Pharmacy, Materia Medica, and Botany, if successful. The lectures were everything that could be desired, but the attendance was too small, and the idea of the other courses was abandoned. The trial would have been made with lectures on practical Pharmacy, if a suitable person of practical and theoretical attainments could have been found willing to undertake it. The Philadelphia College of Pharmacy have a class, this year, of between ninety and one hundred pupils, and your committee deem it inexpedient to open a class again, with a less number than thirty to commence with, and would suggest that a list be opened for names, the classes to commence when they number above thirty, and not until then.

In 1851, a proposition was made to convert the property of the College into stock, and issue one hundred shares of ten dollars each, for the purpose of making one thousand dollars appropriation for addition to the Library and Cabinet, which met with some favor, but as the proposed condition was for not less than one thousand dollars, and only a little less than one half the amount was subscribed at the time, the project was never carried into effect.

Your committee would recommend this plan as important, safe, and feasible. One thousand dollars added to our Library would make it one of the most valuable Libraries of our profession in the country. The books could be obtained at the lowest wholesale price. The present property of the College would be a guarantee capital of about seventy per cent. It was proposed to infringe on no part of the capital for expenses, and all the periodicals and journals taken would be adding constantly to the property. The College would be abundantly able to pay six per cent. interest on capital, and ultimately buy up the stock; so that subscribers would receive six per cent. for the use of their money, the free use of the Library, and have their capital returned to them; and the stock at all times be transferable. Our charter was obtained with special reference to this object. The plan proposed, also, was to have the room opened every day

in the afternoon (or all day), to be used as a place of reference to settle any point that might arise in our business; to make the Library and Cabinet at all times available, in fact, an *Apothecaries' Exchange*, and all at a small expense. Twenty-five members, by agreeing to take charge of the room one afternoon in each month (for certain hours), would accomplish it all. Our intercourse with each other would be there; our bulletin board would contain all new formulæ. All persons in want of assistance in their stores could come here for such; clerks in want of employment would register their names and references here; and samples of all new varieties of goods could here be shown. Physicians meeting in this room also, would be informed, by our bulletin, of any new medicine or formula we wished to introduce to them, and from their board we could learn what they wished to introduce to us. All disputes arising in our business could here be adjusted; and many other advantages secured, in the execution of such a plan.

One provision in the proposition was, to allow the stock to be owned by those not members of the College, for the purpose of extending the benefits of the Library to those who may not be qualified for membership.

The Trustees have appointed a committee to procure a design for a new diploma or certificate of membership. It was expected that the committee would have been ready to report at this meeting. Several designs are in progress, but none have been procured, as yet, which the committee consider suitable. All of the old edition have been used, and the stone from which they were printed lost or destroyed. It is, therefore, absolutely necessary to have a new one; and the question arises, whether, with our limited means, we procure one with reference to economy, or one of elaborate design and workmanship.

The committee are of opinion that a handsome certificate of membership would do a great deal to advance the interest of the College; and as many of our members are unable to attend its meetings or avail themselves of many of its privileges, they would look upon the possession of a handsome diploma as one of the principal objects of membership.

The American Pharmaceutical Association rely in a great measure upon Colleges of Pharmacy for aid in the execution of their designs. Already has the college canvassed New England with its circulars, and received flattering testimonials of favor; and while we are doing our mite in gaining information, collecting statistics, and trying to make professional progress here, our Southern and Western brethren are doing still more in their section of the country towards the same object, and we shall reap equal benefit with them in the immense amount of labor now being performed by that Association. It is to be hoped that we shall not fall behind them in our efforts for the general good. One important object that they are trying to accomplish, is to collect, in all places of the United States, all local formulæ not official, and publish them under their local or appropriate titles, so that such medicines prescribed in any of our southern or western cities can be put up here, and *vice versa*.

The next meeting of the Association takes place in Cincinnati, in July next, before another meeting of the College. We are entitled to five representatives, and the question arises how many shall we send; and if any, what instructions shall be given them as a basis for their action, as the voice of this College on the several important questions to be discussed and decided at that time. That the Association has already accomplished much, there is no doubt; and that it is destined to wield a powerful influence in future, is also beyond a question, and it is undoubtedly the interest and policy of this College to lend its influence and co-operation.

Some provision should be made for the better education of assistants in our dispensing stores. Our apprentice system, if such is an appropriate term, is very defective, and should receive more special attention from the College.

Our College has long felt the want of some practical Pharmacutists, with a thorough theoretical education, qualified to take the professorships, and it is believed that the limited success of our lectures this winter is owing to that cause. It would be well if the College could devise some means to remedy this evil.



It has been suggested that the regulation of retail prices would be a proper subject for the action of this College. The subject is not a new one, and has been unsuccessfully tried by this College in its early days, and it has been deemed inexpedient to legislate on this subject by all similar institutions. But your committee are of opinion that the present retail prices are too low, and would recommend raising a committee to form a scale and consider the whole subject of prices.

The interest manifested in our institution by the medical faculty all over New England, leads us to hope that we may receive their cordial co-operation: and we have no doubt that any advancement by us would be most cordially met by them; and it is suggested whether it would not be for our mutual interest, as well as a benefit to community, to furnish suitable paper upon which to write prescriptions, with the names of our members in Boston and vicinity printed upon it, and all physicians who desire it, be furnished with it gratis.

Wines and spirituous liquors are articles of *Materia Medica*, and used in pharmacy to a greater extent than any other article or class of articles; and as at present understood and practised, pharmacy could not dispense with the use of alcohol in some form. As far as our knowledge extends, it is very seldom, in a well-regulated apothecary store, that liquors are sold except for medicinal, manufacturing, or mechanical purposes, and it is our opinion that their sale should be placed on the same ground as any powerful article of medicine. The members of this College should be exempt from the operation of the prohibitory laws, so far as relates to their sale for the above-mentioned purposes and no other. This course would certainly provide a number of suitable persons for all legitimate purposes in large places, who would always be responsible to the Board of Trustees; for by a provision in our by-laws, no member can hold his certificate of membership, if he ceases to become a member from any cause; and if he refuses to give it up when called upon to do so, the Board of Trustees are required to publish a statement of the circumstances, with his written agreement, that it may be reclaimed by the College. Therefore, if a member be expelled, he would not be exempt from the operation of the Law; and we feel sure that no member would turn his store into a dram-shop, nor could he remain a member if he did. This would give what is equivalent to a standing committee of fifteen on licenses, for those purposes only; whose duty is to look after the moral deportment, as well as pharmaceutical qualifications of its members, with the power to suspend members until the action of the College is known.

We already number a very large majority of all the pharmacutists in Boston of good professional standing. Those interested in professional advancement are seeking admission from the principal cities and towns in New England. We should, then, be very careful who we allow to become possessed of our certificate of membership. We should endeavor to form a correct public opinion, to embrace only those of known professional attainments, that the public may have confidence in the institution, and that our certificates and diplomas shall be a guarantee of qualification.

We should aim to be the organ of communication between the government and the people—between the government and the dealers in drugs; to form a repository of statistics, and a record of all things pertaining to medicine as relating to science and art; to educate our assistants, and make them adepts in the business; to collect a cabinet of all things that may be useful as standards and for comparison; to fix standards of quality; to diffuse a general information of all things pertaining to the business to those engaged in it; to collect a library worthy of the name, for information and reference, on all subjects connected with the profession; and, generally, to create an interest and elevate the standard of pharmacy, as well throughout the country as within our own body.

Although it may seem against the interest of our better educated apothecaries, to assist their less favored competitors to the means of getting a better pharmaceutical education, to divide or make common stock of any peculiar improvement in the art they may have, we hold it a duty to humanity to do the best in our power to repress the abuses in the preparation and dispensing of



medicine; to place the means of obtaining a liberal pharmaceutical education before the rising pharmaceutiats of our country; to cultivate a taste for scientific investigation in our art, promote concert of action, demand a higher grade of quality in our imported drugs, and to promote a greater degree of excellence and uniformity in our preparations.

Respectfully submitted.

DANIEL HENCHMAN,  
WM. A. BREWER,  
SAMUEL M. COLCORD,  
T. LARKIN TURNER,  
JOSEPH BURNETT.

Several of the projects recommended in this report have been carried into effect, among them the publication of a price book. This consists of a leather covered duodecimo pamphlet of 58 pages, printed on letter paper, embracing the *Materia Medica* and the preparations. Opposite each name is the price per pound, 4 oz. or 1 oz., fixed upon, and the opposite page is left blank and ruled for the record of changes and remarks. The object of this book is to induce a concert of action among the apothecaries of Boston, so as to get uniform prices adopted.

Another step is the issue of prescription blanks for the use of physicians, duly headed with place for number, date, etc., and of uniform size. On the back, printed in small type, is a correct list of the members of the Massachusetts College, with their address severally, which enables the physician to know to whom to send his prescriptions in each section when he is at a loss to determine. These blanks are furnished to physicians gratuitously.

The energy displayed by our New England friends is highly praiseworthy, and will soon bring forth excellent results.

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POLYTECHNIC COLLEGE OF THE STATE OF PENNSYLVANIA.—The second annual announcement of this institution has been received. To any one acquainted with the practical fruits of the best polytechnic schools of Europe, in affording a means of developing the executive talents of young men and of fitting them for the important stations requiring executive ability, whether in civil or military engineering, or in agriculture, mining or general mechanics, the project of establishing such a school under the auspices of the State of Pennsylvania must be satisfactory.

“The establishment neither of a school of ENGINEERING, nor of MECHANICS, nor of CHEMISTRY, nor of MINES, nor of AGRICULTURE alone, would have fulfilled the object contemplated in the founding of this institution: any one might have furnished half-educated graduates, but their union in a POLYTECHNIC COLLEGE affords an education, solid, elevated and usefully applicable in all the higher departments of construction and of production—one which provides for a wider range of honorable employment, than any which has hitherto been afforded.

“The wants of a people should mould their educational system. Our first great duty and destiny, is to reclaim a continent to cultivation and civilization. Swamps, fluvial and littoral, are to be drained; plantations to be irrigated; dwellings to be warmed, lighted and ventilated; cities and towns to be graded, sewered, and supplied with water and gas; rivers made navigable; mountains tunnelled, and the great inter-oceanic lines of travel and transport extended and completed; untold mineral and agricultural treasures are to be produced, and

wrought on a scale commensurate with the vastness of our resources; furnaces, mills and foundries, are to be erected and conducted. These to be followed by the higher and more delicate branches of manufacture, and these again, by the more graceful arts of design, the triumphs of the pencil, the graver and the chisel.

The faculty consists of four principal professors, viz: 1st, of metallurgy and of industrial, analytical and agricultural chemistry; 2d, mathematics and civil engineering; 3d, of mining engineering, mineralogy and geology; 4th, of mechanical philosophy and the principles of machinery. Besides these chairs, the last of which is not yet filled, the curriculum includes the Spanish, French and German languages, and mechanical, architectural and topographical drawing by distinct teachers, and recently an Academical department has been added.

With objects so valuable, this institution deserves the best wishes and support of all interested in promoting knowledge and progress. So far it is an experiment; it remains to be seen whether the American public will appreciate the advantages offered by the institution, and whether the faculty will succeed in sustaining the high ground they have taken. We wish them entire success.

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EDITORIAL BOOK NOTICES.—It is not always an easy task to write a book notice that will please the author and publisher and yet do justice to the truth. The primary object of noticing books in periodical journals, would seem to be as a means of information to the reader of their general character, if new books, or of the nature and extent of the additions or changes in revisions, that he may be assisted in forming an idea of their value or improvement. The secondary object of such notices is to advertise the book and the author as a matter of profit and reputation. The order of importance has now-a-days been much changed. The primary object often appears to be complimentary to the author or *praisefully* useful to booksellers, for whose benefit a few choice sentences or paragraphs are inserted, brief enough for extraction and due reiteration in advertisements. In this condition of things the editor of a journal is apt to find himself in a dilemma. If he aims at not giving offence, he is often compelled to select his language so nicely that the reader is at a loss to tell whether most of blame or praise is intended, and his critique, like the misty sentences of the Delphian oracle, may mean the one or the other, as suits the author who feels, or the reader who judges. If he speaks the plain truth, he must often prepare himself for ill-natured reflections, cold shoulders, and sometimes for that *small* artillery of the publisher, the withholding of future publications as a *penalty*. To wound the feelings of an author or editor intentionally, by ill-natured, untruthful or invidious remarks, uncalled for by the material reviewed, is wrong and often cruel; to do it unintentionally, when following the line of editorial duty, is extremely unpleasant, especially when such a result is not anticipated. With the publisher the wound, if any occurs, is

entirely of a pecuniary nature, and an intentional criticism unjustly aimed at him is equally wrong, and unworthy of the impartial editor; yet, the conductor of a journal will fall far short of his duty if, for fear of giving offence to a publishing house, he withholds needful criticism or glosses over error.

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*A Universal Formulary ; Containing the Methods of Preparing and Administering Official and other Medicines. The whole adapted to Physicians and Pharmacutists.* By R. EGLESFELD GRIFFITH, M.D. A new edition, carefully revised and much extended, by ROBERT P. THOMAS, M.D., with illustrations. Philadelphia, Blanchard & Lea, 1854; pp. 651.

It is now more than four years since the author of this work, then a confirmed invalid, (since deceased) and working under depressing circumstances, finished its preparation and put his sheets in the hands of the publisher. It was a work requiring much perseverance, and when published was looked upon as by far the best work of its kind that had issued from the American press, being free of much of the trashy, and embracing most of the non-official formulæ used or known in American, English or French practice, arranged under the heads of the several constituent drugs, placing the recipe under its more important constituent. Dr. Griffith availed himself extensively of Mohr and Redwood's treatise on pharmacy, then just re-published here, in reference to weights and measures and remarks on pharmaceutical processes. One of his most useful chapters is the "Index of Diseases and their Remedies," by which the physician or apothecary, desirous of turning to formulæ applicable to a certain form of disease, can readily do so. Another useful chapter is that on poisons and antidotes.

The edition then published having been exhausted, the present one has been brought out under the superintendence of Prof. R. P. Thomas, of the Philadelphia College of Pharmacy. On comparing the two editions, it appears that more than eighty pages have been added; this is due partly to the illustrations which have been introduced, but mainly to new matter interpolated by the editor, who appears to have gone over the text with great care, as he found numerous errors of the press and some of fact, of greater or less importance, which had escaped the author's notice. The new formulæ of the current journals have been added, many from Dornvaul's *L'Officine*, and those of the United States, London and Dublin pharmacopœias which are new or altered, these codes having been revised since the first edition was printed. The addition of the wood cuts, from Mohr and Redwood, before alluded to, are appropriate, and assist in conveying many ideas in practical pharmacy to medical readers not so readily acquired by mere description. Prof. Thomas has certainly *improved*, as well as added to this formulary, and has rendered it additionally deserving of the confidence of pharmacutists and physicians.

THE DISPENSATORY OF THE UNITED STATES OF AMERICA. By George B. Wood, M.D., &c. and Franklin Bache, M.D., &c. Tenth edition, carefully revised, Philadelphia, Lippincott, Grambo & Co., 1854; pp. 1480 octavo.

The appearance of the tenth edition of the Dispensatory so soon after the edition of July, 1851, is solid evidence of the esteem in which this truly American work is held by the medical and pharmaceutical professions, especially when it is understood that both editions have extended to ten thousand copies. The reputation of the authors for accuracy, and their care and pains in bringing into each successive issue the discoveries and observations that have occurred in the interim, have given their work the full confidence of the American medical public. We hazard little in saying that this work has done more for the improvement of American pharmacy than any other single agency, not but that other and important agents have successfully operated meanwhile, but this book, bearing as it does on its pages the latest and most accurate information in a form and arrangement suited to the comprehension of even the unread apothecary, has penetrated to the remotest village of the most sparsely settled of the States, and is constantly operating beneficially on the dispensers of medicine, be they pharmaceutical or medical.

The United States Dispensatory lays no claim to scientific arrangement. The alphabetical order of its contents extends throughout, and in the description of substances more attention is given to simplicity and perspicuity, than to scientific order and classification. Yet, for comprehensiveness of detail, for the accuracy of its facts, and for the careful accrediting of observations, it is not surpassed by any work in the English language. Pereira's *Materia Medica* alone exceeds it in scientific detail. The beautiful but complex arrangement of that great work, based on the natural systems of plants and animals, will always give it pre-eminence as a text book to the advanced student of *materia medica*; but for adaptation to the wants and understanding of the great body of practitioners for whose instruction and guidance it is intended, the United States Dispensatory stands, in our opinion, unrivalled by any single work in any country. Our time has not admitted of an analysis, nor, perhaps, is it needful. Yet, so important a place has this book assumed in reference to the progress and development of American Pharmacy, that its pages should be watched with a jealous eye by every apothecary and physician. The United States Dispensatory is *practically* the *Pharmacopœia*. The excellent commentary on the latter which the Dispensatory contains, has led to its general substitution for the National Code, and many only know the *Pharmacopœia* through its pages—a fact greatly to be regretted, however honorable to the authors—as it detracts from its distinct nationality, by presenting its formulæ intermingled with those of the British *Pharmacopœias*. So long as this continues, every error or mis-statement should be as freely brought to light and canvassed, as though its authors were a “*pharmacopœia* committee,” that they may be corrected in a future edition.

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NOVEMBER, 1854.  
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NOTICE OF SOME OF THE INDIGENOUS MEDICINAL PLANTS OF  
CALIFORNIA.

BY GUSTAVUS L. SIMMONS.

California, heretofore rendered famous by her varied mineral deposits, will acquire a new and as worthy a name for her botanical treasures, whenever they are fully known. The discovery of the gigantic "*Washingtonia*" of her forests, which has excited the admiration of botanists throughout the world, may be called but one of a series of important discoveries in this science, which a faithful examination of her productions cannot fail to develop.

From the "Sierra Nevada" range of mountains to the Pacific Ocean, hardly a mile of land can be traversed which does not yield either some well known remedial agent, or a new specimen of apparently high medicinal power.

In Medical Botany there are known at present varieties of the Sarsaparilla, Scilla, Eupatorium, Mentha, Stramonium, Rhus, Salvia, Althea, Aconitum, and Anthemis; besides numbers of shrubs and trees, some of which have been supposed to be indigenous only to foreign countries. One of these is the "*Laurus nobilis*" or Bay tree, which grows in perfection within seventy-five miles of Sacramento. It attains the height of some ten or twenty feet. The leaves are highly fragrant, and the "bay water" distilled from them has their peculiar odor.

The "*Juniperus sabina*" (Savine) flourishes in the soil of the lower range of the Sierra Nevada. This is an evergreen of thirty feet high, and yields a large quantity of fragrant flowers.

The "*Cornus Florida*" also abounds in the same localities, and grows to the height of forty feet.

Among the indigenous medical plants of California there are two in common use which seem to possess virtues worthy of notice, the knowledge of which has been acquired by the Ameri-

cans from the native Californians or hunters. One of them is the Spanish "*Amole*" or soap plant.

This plant was noticed by "Fremont" and other writers on California for its saponaceous properties, but it has only been since the occupancy of the State by the American people, consequent upon the gold excitement, that a knowledge of its medical properties has been known.

Presuming it has been botanically described, (not having the authorities to certify the fact) I will merely give its chief characteristics only for the purpose of identification.

The "*Amole*" is a bulbous plant; leaves lanceolate, acuminate, radical, entire, glabrous from 8 to 12 inches in length; scape from 3 to 6 feet high; flowers white, in terminal racemes, panicles small; perianth tubular, 6 parted, 10 lines in length; ovary 3 celled; bulb perennial, 3 inches in diameter,  $4\frac{1}{2}$  inches long; scaly; external scales dark brown and fibrous, internal layers white and tender.

*Habitat*.—Neighborhood of lagoons, Sacramento Valley.

The bulb is the portion used for medical purposes. This, when broken apart and agitated with water, forms a soft and creamy mucilage, from which it has derived its name of "*Amole*."

The mucilage resembles the "*Mucilago acacia*." Boiling thickens it, and a solution of the subacetate of lead affords no precipitation.

It has a sweet taste, and leaves no unpleasant sensation in the mouth. Two drams operate as a laxative in from four to six hours.

Its principal use in California is as an external emollient application. Many Americans while travelling through the States have been poisoned by the "*Rhus toxicodendron*," which grows there in great abundance. The poison from this article in California is generally of the most violent type, and the usual course of treatment has often failed to afford relief. Some persons when suffering from the malady were advised by the *natives* to make an application of "*Amole*," and after doing so found themselves relieved; until now the remedy is well established, and in common use.

Not only is it beneficial in subduing the inflammation consequent upon poisoning, but in all erysipelatous affections, and many



cutaneous diseases, it has proved itself a safe and reliable remedy. It is prepared by taking off the coarse external scales of the bulb, and grating the remainder in a close vessel, a sufficient quantity of water is then added, and the whole triturated until a thick mucilage is formed; this is strained through coarse muslin, and it is applied to the affected part in a similar manner to a *cataplasm*, at the same time it is administered internally as often as may be necessary to keep the bowels open.

"*La Yerba Resinosa*" (so-called by the Californians,) is another plant worthy of notice. It grows from  $1\frac{1}{2}$  to 3 feet high. Leaves, alternate, sessile, oblong obtuse, serrulate, deciduous, 2 inches long; flowers, collected into a dense capitulum; scales, setose, monaceous; diameter, 1 inch; color, orange yellow.

The leaves, head, and stem of this plant are covered with a transparent resinous substance, which has a strong aromatic odor, resembling somewhat that emanating from the balsam fir.

This resin is most abundant when the plant is in full flower. At these times if the finger is applied to the under side of the capitulum, and allowed to remain there for a few seconds, upon withdrawal the resin will be found adhering in long transparent strings.

It gathers in tears around the base of the scales, and is a source of inconvenience to the traveller, who is obliged to come in contact with it. The plant flowers from June until August, and its odoriferous properties are so strong and peculiar that the scent which at first seems pleasant, finally becomes disagreeable, and even sickening.

An alcoholic tincture of the leaves and flowers in the proportion of two ounces to one pint of sp. vin. rect., yields upon evaporation two drams of the resinous substance.

Obtained in this form, it presents a greenish black appearance, and retains the peculiar odor of the plant.

The medical properties of "*La Yerba Resinosa*" are those of a tonic *febrifuge*. The prevailing malady in California is intermittent fever. In some localities, at certain seasons of the year, no age or sex is exempt, and the discovery of an indigenous plant possessing the properties of the usual febrifuge remedies, cannot fail to prove a blessing, especially to those who reside at remote distances from cities and towns.



The usual manner of preparing this remedy is by decoction, although many make a tincture with some kind of alcoholic liquor.

The last method would seem to be preferable, as the resinous property of the plant is soluble in water only to a limited extent.

Its effects upon the system seem to be somewhat similar to those produced by cinchona, yet they more closely resemble those produced by the action of the *Eupatorium perfoliatum*. Given warm, even when a chill or fever is present it produces a profuse diaphoresis, and carried to any extent, catharsis, and sometimes emesis. It is used in dysenteries and diarrhœas, as well as fevers; and as these maladies in California are usually more or less complicated with intermittent symptoms, it is given with considerable benefit.

From its abundance and apparently high medicinal virtues it is to be hoped that medical men generally will test its efficacy, and if it does possess the attributed properties, have it placed in a prominent position in our *Materia Medica*.

*Sacramento, Cal., Aug. 15th, 1854.\**

## PHARMACEUTICAL OBSERVATIONS ON BUCHU.

BY HENRY N. RITTENHOUSE.

(*Extracted from an Inaugural Thesis.*)

The author, after describing the botanical characters of the plant, refers to the analysis of Brandes and Cadet. The former found *pale yellow volatile oil*, 0.88; *resin*, 2.34; *bitter extractive* (diosmin,) 3.78; *chlorophylle*, 4.77; *gum*, 12.71; *lignin*, 45; *brown substance, extracted by potash*, 1.56; *nitrogenous matter, extracted by potash*, 2.42; *albumen*, 0.58; *malic acid*, 1.56; *various salts, bassorin, water, &c.*, 20.54; *acetic acid and loss*, 5.86.

Brandes attributes the activity of buchu to the volatile oil chiefly, and to the diosmin or bitter extractive.

\*[This communication was elicited by a request from us that the author would give some account of the indigenous medical plants of California. We trust he will continue the subject as his leisure permits. If our friends in other sections would write us occasionally about what they observe, much interesting matter would find a place in our pages.—EDITOR.]

Cadet's analysis gave *volatile oil*, 0.665; gum, 21.17; extractive, 5.17; chlorophylle, 1.10; resin, 2.151; lignin &c., 69.744.

The author obtained a highly volatile oil by distilling the leaves with water. It had a mint-like odor, reddish-brown color, and aromatic, warm, pungent taste, with a sweetish rather pleasant after taste. It is yielded in the proportion of  $\frac{3}{4}$ th of one per cent. This volatile oil is lighter than water. In distilling buchu, the oil comes over with the first portions of water, and hence the process should not be continued too long. He also "obtained an extractive matter by precipitating the alcoholic and watery solution by infusion of galls. It is dark green, slightly bitter, nearly odorless, insoluble in cold water, but soluble in alcohol, ether, and a weak solution of carbonate of potassa."

The author then alludes to the medical properties of the drug and the several pharmaceutical preparations which have been suggested, and makes the following critical remarks on the published formula for the fluid extract of buchu, viz:

A preparation called "The Fluid Extract of Buchu" was suggested by Prof. William Procter, Jr., of this city, who published a formula for it in the *American Journal of Pharmacy*, vol. xiv. page 86, of which the following is a copy:

"Take of Buchu leaves,	℥ viij. (Troy.)
Alcohol,	f. ℥ xvj.
Water,	q. s.

Reduce the leaves to coarse powder, moisten them in a covered vessel with f. ℥ 12 of the alcohol, macerate them for six hours, and introduce the mass into a suitable displacer. When the clear fluid has ceased to drip, add the remaining alcohol mixed with four fluid ounces of water gradually, until the displaced alcoholic liquid amounts to twelve fluid ounces, which is set aside until reduced to six fluid ounces by spontaneous evaporation. The residue in the displacer is then treated with a pint of cold water by maceration for twelve hours, and subjected to pressure until a pint of fluid is obtained. (Displacement may be resorted to, but the mucilage renders it ineligible.) This is evaporated to ten fluid ounces mixed with the six fluid ounces of evaporated tincture, and after occasional agitation for several days may be filtered or strained to remove the undissolved resinous and gummy matter. Thus prepared it had a dark brown color, a strong and rather pungent taste of buchu, and is administered in the doses of one or two teaspoonsful, which represent one half or one dram of the leaves. Another extract was prepared by him by evaporating the tincture to four fluid ounces,

the infusion to eight fluid ounces, and then dissolving in the mixture eight ounces of powdered sugar by agitation."\*

Another preparation, called "The Compound Fluid Extract of Buchu" has been prepared, but it does not seem to have the odor or taste of the leaves very strongly marked. In view of the increasing popularity and demand for fluid extracts, both among the medical profession and the public at large, on account of the more or less entire absence of alcohol, the smallness of the dose, and the more certain effects of the medicine; the volatile principles being rarely submitted to the action of heat, and preparations of this class being thus more perfect representations of the drugs employed than almost any other; I have been induced to prepare a fluid extract of buchu that should possess all the above advantages, for buchu is known to possess valuable remedial properties which have been, as far as I can learn, very much laid aside without great cause, and other medicines substituted which are less certain. The following is the formula which I have found most successful in producing a perfect preparation:

Take of Buchu in coarse powder,  $\bar{3}$ vij.

Ether, f. $\bar{3}$ vi.

Carbonate of potassa,  $\bar{3}$ ss.

Alcohol,

Water, of each a sufficient quantity.

Add a dram of the carbonate of potassa to the powdered leaves, then the ether mixed with one pint of the alcohol; having incorporated them thoroughly, allow them to macerate twenty-four hours, then transfer the whole to a percolator, and pour on diluted alcohol until a pint of ethereal liquor is obtained, put this into a suitable vessel and allow it to evaporate spontaneously until reduced to four fluid ounces. Upon the mass in the percolator pour on water mixed with one fourth its bulk of alcohol, and holding the remainder of the carbonate of potassa in solution until the percolated liquor amounts to a pint; remove the dregs and express

\*[The process which we have followed for several years past is a modification of the original, which consists in substituting diluted alcohol for water in the latter part of the process as in the *officinal* formula for the fluid extract of valerian. The resulting fluid extract is rather more alcoholic than the original, but retains more of the oleoresinous principles.—EDITOR.]

them until another pint is obtained, washing them with water, if necessary, to make up the measure; mix this with the pint last obtained, and evaporate on a water bath to four fluid ounces; add this to the four ounces left after the spontaneous evaporation. The resulting fluid extract should measure eight fluid ounces; if less than that, the deficiency can be made up by the addition of diluted alcohol. Fluid extract of buchu as thus prepared is of a dark green color, and has the odor and taste of the leaves in a concentrated form. I have tried several ways of making this extract, but have found none so satisfactory as the above. The first was with twelve fluid ounces of alcohol and four of ether to eight ounces of leaves, mixing the alcohol and ether with the buchu without previous maceration, then displacing a pint by the addition of diluted alcohol. Set this aside to evaporate spontaneously until reduced to four fluid ounces. Upon the mass in the percolator I poured diluted alcohol until ten fluid ounces had passed, and evaporated this in a water-bath to four ounces, then mixed them; this was of a very dark color, and tasted quite strongly of the leaves; but in evaporating spontaneously, a resinous matter was deposited on the sides of the evaporating vessel and would not mix smoothly with the extract.

I next made an extract according to the above formula, to which I added an ounce of sugar to an ounce of extract; this did not possess any advantages over the other. Another was then prepared in the same proportions as before, and conducted in the same manner in the first part of the process, but to the mass in the percolator I added water, holding carbonate of potassa in solution; this was allowed to percolate twenty-four hours, then expressed, and evaporated to the same quantity as the first, and mixed.

The object of adding carbonate of potassa is to dissolve out two substances noticed by Brandes, and called by him brown substance extracted by potash, and nitrogenous substance extracted by potash. Ether and alcohol I supposed would dissolve the volatile oil and resin, and the presence of the alkali in the watery infusion prevents its subsequent precipitation. Water, according to the same chemist, dissolves the bitter extractive, or what he terms diosmin, which he says is insoluble in alcohol and ether but soluble in water. I found an advantage in adding a

portion of the carbonate of potassa with the leaves while macerating, for I think it prevents the deposition of any resinous matter on the sides of the vessel during the evaporation, which otherwise takes place, producing some loss. The addition of alcohol to the water in the proportion of one-fourth its bulk, was done from the fact that many vegetable substances are more easily percolated when the acting menstruum contains a little alcohol, and the above proportions have been found to answer very well in practice. Some addition of this kind was rendered necessary on account of the mucilaginous nature of the plant in question, which, otherwise, is ineligible for the process of displacement, as it takes place very slowly, requiring much time to perfect it. During the evaporation of the alcoholic and watery extract a semi-fluid matter separates on the top, it has the consistence of coagulated albumen, is of a dark green color and scarcely any odor, it does not redissolve in the liquid from which it separates. It dissolves slightly in cold and boiling water, is less soluble in cold and boiling alcohol, and entirely insoluble in ether. The watery solution of this was of a yellowish brown color; sulphuric acid changes it to a reddish brown, solution of sub-acetate of lead threw down a copious greenish white precipitate, tannin produced no change; when dry it is brittle, and swells up when macerated in cold water for a length of time, and finally dissolves.

The dose of this fluid extract is from one half to one fluid dram, to be repeated as circumstances require, for one fluid ounce of extract represents an ounce of the leaves. In a case that came under my notice of an affection of the kidneys, it was used in teaspoonful doses three or four times a day, and at the end of one day the patient experienced considerable relief and has continued to use it ever since on a return of the complaint. The following is a statement of another case of Dr. O. H. Taylor's, of Camden, N. J., to whom I presented some of the fluid extract for trial. He says in his letter to me, dated Nov. 4th, 1853: "In the month of July last, I was requested to visit Capt. D\*\* B\*\*\*\*, aged 84 years. At the time of my visit he was suffering from a painful and irritable state of the bladder, with frequent disposition to micturition, and occasionally an inability to pass water for several hours; this alternate state had existed with him, more or less, for two or three years. From the history of

his case, I have been led to the impression that irritable condition of the bladder was induced sympathetically by functional disease of the kidneys, and partly connected with a morbid condition of the prostate gland and surrounding parts. Whatever may have been the pathological condition of the parts throughout in the case, it will be sufficient for me on the present occasion to say, that notwithstanding my having resorted to the usual diuretics and other remedial agents without the success I desired, I was, through your suggestion, induced to make trial of the fluid extract of buchu. I directed a fluid dram to be given three or four times daily. This course was continued until my patient had taken five or six fluid ounces. The relief was gradual from day to day, until the patient was finally relieved. Capt. B\*\*\*\*\* assures me that he considers himself effectually relieved, inasmuch as he has up to the present time had no return of his distressing symptoms." Before closing this thesis I would briefly state the advantages which I conceive the fluid extract above proposed possesses over any other preparation of buchu.

In using infusion of buchu more or less of the volatile oil is unavoidably dissipated, and the resinous matter probably nearly all left behind undissolved. This objection applies with even greater force to the home-made infusion often ignorantly prepared, and still more to the solid extract, which must be nearly inert. The tincture of buchu probably contains most of the active matter, but has the stimulant and irritating properties of a large proportion of alcohol to a very small proportion of the remedial agent. Neither of the fluid extracts which have been already put before the public appear to me to possess to so great a degree as the one I have above proposed the sensible and active properties of the buchu, and one of them in particular seems very deficient herein. On the other hand this fluid extract has the volatile oil and resinous matter taken up by the ether and alcohol, with sufficient carbonate of potassa to retain them in solution afterwards, and the bitter extractive of Brandes with the brown substance and nitrogenous substance mentioned by him, taken up and retained by the alcoholized water holding the carbonate of potassa in solution. At the same time the quantity of this alkaline salt in each dose of the extract is so small as not to be likely to interfere



with the remedial effects of the medicine, but on the contrary it is believed will be found to be a useful adjunct to the diuretic property.

# ON GILLENIA TRIFOLIATA—AMERICAN IPECACUANHA.

(Review of Theses.)

*On Gillenia trifoliata.*

By JOHN H. RUCH.

*Idem.*

By JOSEPH L. LEMBERGER.

*Idem.*

By JOHN WYETH.

*Gillenia trifoliata as compared with  
Ipecacuanha.*

By DAVID LEWIS, JR.

For many years past it has been the constant aim of the Professors in the Philadelphia College of Pharmacy to persuade the candidates for graduation to select as subjects for their theses, either articles of a chemical nature, or else those calculated to develope and bring into more general notice our indigenous medical plants. Of the success of these efforts, the pages of this Journal have afforded convincing proofs. It is true that, in many instances, the published analyses will not bear a strict comparison with the splendid results obtained in European laboratories from analogous subjects, yet, bearing in mind the difficulties under which the American student of Pharmacy labors, there is much reason for being gratified with what has already been accomplished in the analytical study of our native plants.

The subject of the present article was suggested to the class of last year, and as the result, four theses were presented for examination. A comparison of these proves by the harmony of the general results the accuracy of the operators, and by the difference on some points, the fact that each experimenter proceeded without the knowledge of the plant being investigated by any other than himself.

Of the processes for obtaining the more common and unimportant constituents of the powdered root it is unnecessary to speak, since they are well known to pharmacutists. In the following summary, therefore, they are passed over.

STARCH.—The presence of this principle, as revealed by the iodine test, is announced by all of the experimenters.

GUM was detected by all but Mr. Lewis, who doubts its presence.



ALBUMEN is shown to exist by the experiments of Messrs. Ruch and Lemberger.

VOLATILE OIL is supposed by Messrs. Lewis, Ruch, and Wyeth to be present in small proportion, from the fact that water distilled from the root assumes a milky appearance, although no globules separate upon standing. This, however, may be owing to the small quantity of the root employed in each instance. Mr. Lewis washed a portion of the distillate with ether, and thereby rendered it transparent.

WAX and FATTY RESIN were found by all; the former having been obtained from the alcoholic, and the latter from the ethereal extract.

LIGNIN is spoken of by Mr. Lewis, and

COLORING MATTER by Messrs. Ruch and Wyeth.

GALLO-TANNIC ACID was detected by Messrs. Lewis, Ruch, and Lemberger by the blue-black precipitate afforded with the tincture of chloride of iron (which was not dissipated by heat) and by a precipitate with gelatine. Mr. Wyeth considers it as gallic acid.

LIME AND POTASSA were obtained from the ashes by Messrs. Wyeth and Lemberger.

IRON was found in the ashes by Mr. Lemberger's experiment of treating the lixivated ashes with diluted muriatic acid, and adding a solution of ferro-cyanuret of potassium, when a Prussian blue precipitate was produced.

PECULIAR PRINCIPLE.—Each of the experiments seems to have adopted the idea of the existence of a close analogy, if not of an absolute identity between the active principle of this plant, and that procured from the officinal ipecacuanha. Hence the mode of procedure for obtaining it was essentially that of the Paris Codex for impure emetia. That is, by treating a concentrated alcoholic extract with cold water, filtering the solution, and evaporating nearly to dryness. This plan was tried by Messrs. Lewis and Lemberger, and afforded an active extractive matter. The syrupy aqueous fluid being spread on panes of glass and dried by a moderate heat.

The same gentlemen, as well as Mr. Ruch, subjected the powdered root to the action of ether, (in a second series of experiments,) to remove the fatty matter, before making the alcoholic and watery extracts. The value of this seems doubtful; for Mr.

Lewis says, "this preliminary step (the addition of ether) appears to be hardly necessary, however, and in some operations was dispensed with as superfluous." In fact, as Mr. Ruch declares that the alcoholic watery extract, prepared like the impure French emetia, is soluble in ether, there is some reason for supposing that the previous action of the ether, if added freely, is injurious, since some of the active principles may also be taken up and lost. The third experiment of Mr. Lemberger confirms this view. He digested "eight ounces of coarsely powdered root for several days in sulphuric ether, and then displaced it by frequent additions of the same menstruum until it passed through colorless." The residual powder was displaced with alcohol to get the alcoholic extract, and this in turn dissolved in water and evaporated down, when a "product not exceeding one grain in weight" was obtained.

If there was no fallacy in the experiment, ether must be a good solvent, capable of taking up and holding the active principle in solution; otherwise more than one grain of extract would have been obtained from half a pound of the root. Mr. Wyeth adopted the following plan for concentrating the active principles. "Adding to a portion of water acidulated with sulphuric acid, the cortical portions of the root; digest in a water-bath for twelve hours, then filter, add carbonate of lime to saturation and again filter. Digest the residue left on the filter with alcohol, filter the liquor thus obtained, mix it with the former liquor, and then evaporate to consistence of an extract. Treat with water, then filter the resulting liquor and evaporate." The same experimenter says: "A portion of alcoholic extract treated with water was of a nauseous, bitter taste, but not so decided as that obtained by acidulated water in the process mentioned above."

PROPERTIES OF ALCOHOLIC WATERY EXTRACTIVE.—It is in scales of a light yellowish-brown color, transparent and deliquescent; of a bitter, nauseous taste, leaving an acrid impression in the fauces; soluble in water, alcohol, and ether (?); and affords precipitates with solution of tannin, acetate and subacetate of lead, and nitrate of silver. It appears to be nearly neutral in its reactions.

REMEDIAL PROPERTIES.—Mr. Ruch says the extractive "proved emetic in the dose of three grains, administered in divided doses."

Mr. Wyeth remarks that two grains of his extract from acidulated water produced nausea and diaphoresis. Mr. Lewis "dissolved a grain and a half in a fluid ounce and a half of water, and swallowed it in half ounce doses at intervals of a few minutes. Great nausea attended with emesis ensued. Its unpleasant effects continued the remainder of the day." Mr. Lemberger's personal experience was precisely similar, namely, that in doses of one grain, repeated at intervals of fifteen minutes, the extractive acts as a nauseant and emetic.

On the whole, conclusive testimony is furnished by the foregoing analyses of the intrinsic value of the *Gillenia trifoliata*, and of the facility of making concentrated and active preparations from it, that would compare, perhaps, not very unfavorably, in mildness and certainty of operation with those from the South American plant.

The researches of the authors of these theses were partly designed to prove the similarity of the North and South American ipecacuanhas. But it cannot reasonably be inferred that the same principle exists in both; since the respective plants are derived from two entirely distinct natural orders, the *Rosaceæ* and the *Cinchonaceæ* of Lindley. A failure to prove identity, however, is no cause of regret, more especially, if the very experiments instituted for that purpose afford a moral certainty that there is a distinctive principle in the *Gillenia trifoliata*.

Three of our experimenters made some attempts to determine the fact, but a small supply of the root prevented its accomplishment; and it is left to some future operator to separate from the alcoholic watery extractive above described, the active principle of the *Gillenia trifoliata*.

R. P. T.

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#### ON A NEW VARIETY OF FLAXSEED.

BY WILLIAM PROCTER, JR.

During a recent visit to Cincinnati, Mr. Edward S. Wayne showed me, in the cabinet of the College of Pharmacy, of that city, a specimen of flaxseed, differing in appearance from the common brown seed, it having a greenish yellow color instead of the well marked deep brown of the ordinary drug. In size, shape, and lustre they appear to be quite alike. The history of this

variety of flaxseed is clearly traced, and Mr. Wayne has kindly given it to me, as follows :

Mr. E. Everingham, who resides about fourteen miles east of Piqua, Miami County, Ohio, in 1846, observed in his field of brown flaxseed, *one stalk* with white blossoms, and taller than the rest of the field. He carefully marked the place, and on gathering the seed, when ripe, found it, to his surprise, to be entirely different from any he had ever seen. Next season he sowed it in his garden, but the plants were nearly destroyed by worms, yet he succeeded in gathering about a teacupful of the seeds. From that time it succeeded well, and proved to be more productive than the brown seed: The first seed sold was to Messrs. Sawyer & Jackson, of Piqua, for \$3 per bushel, and another lot at Urbana, Champlain County, at \$4 the bushel. Messrs. Sawyer & Jackson, who have had considerable experience in manufacturing oil from it, still give it the preference over the brown seed.

At the State Agricultural Fair, held in Cincinnati, in 1850, a premium was awarded for it as a new and valuable variety. The crop of seed this year is estimated at about fifty thousand bushels, which speaks well for its productiveness. Mr. Wayne was informed that it takes three pecks of brown seed to sow an acre, and of the white variety but two pecks is required, the product being equal.

At first sight this variety of flaxseed might readily be taken for canary seed, but on closer inspection it will be found to be lighter in color, flatter, and not so pointed. When bruised in a mortar with a little water they afford a stiff, ropy, mucilaginous paste, having very little color, with the peculiar odor of ordinary flaxseed. One hundred parts of the powdered seeds afforded to ether, 32 parts of oily residue. Macerated in cold water they communicate a mucilaginous consistence to it, and the mucilage affords precipitates with alcohol and subacetate of lead precisely as that of ordinary flaxseed mucilage. In fact, from the slight examination to which it has been subjected, the absence of the brown coloring matter appears to be the only difference. The absence of color is an advantage in favor of its use in medicine, as the meal produced affords a cataplasm less repulsive in appearance. It is probable that the oil it contains is less colored, which is a desideratum to the painter.

## ON EUPATORIUM PERFOLIATUM.

By MORTIMER H. BICKLEY.

*(Extracted from an Inaugural Essay.)*

There are several valuable items of the *Materia Medica* which are constituted so peculiarly that they puzzle the chemist in his attempts at seizing on and isolating the principle or principles which give them activity, so as to say with certainty what is and what is not worthy of such a character. Mr. Bickley has chosen one of this class which has frequently been tried before by essayists. The following remarks are condensed from his thesis.

Eupatorium contains a large amount of matter soluble in cold water, as, when exhausted by that fluid, it yields 40 per cent. of extract. The cold aqueous infusion was found to contain a little *tannin, gallic acid, albumen, gum, and saccharine matter.*

The residue, dried and percolated with alcohol, afforded on evaporation an extract, consisting of chlorophylle, wax, resin, etc.

A new portion of the flowering tops and leaves, when distilled with water, afforded a slightly milky, odorous distillate, which was considered as containing volatile oil.

When a strong tincture is thrown into water a resinous matter precipitates.

The ashes of eupatorium contain carbonates of potassa and lime, and oxide of iron.

With a view to isolating the bitter principle, Mr. Bickley employed the process of M. Lebourdais. A quantity of cold infusion was prepared from the powdered eupatorium, and passed slowly through a thick layer of purified animal charcoal, as long as it was deprived of color and taste. The charcoal was then washed with water, dried and treated with boiling alcohol of 95°. The alcoholic liquid was filtered and evaporated until reduced to a light brown, extremely bitter extract soluble in ether, but slightly in water.

Its alcoholic solution by slow evaporation deposits a yellow, slightly crystalline substance, extremely bitter and nauseating. Mr. Bickley did not proceed further in his experiments, so as to determine the nature of this yellow matter, which is to be regretted, unless himself or some other investigator will commence where this essay leaves the subject, and explore it thoroughly.

## REMARKS ON CUPREOUS SODA WATER, WITH COMMENTS.

*To the Editor of the American Journal of Pharmacy.*

DEAR SIR,—I saw an article in your last journal upon the "*Poisonous Effects of Soda Water from copper fountains and lead pipes*," by J. Ogden Doremus, M.D., in which he states that he "procured several gallons of the favorite beverage and submitted it to chemical examination." The substance which first attracted attention was copper. "This was very abundant in soda water obtained from several obscure shops, where it was presumed the traffic was limited, and, consequently the acid water remained longer in the copper condensers." Persons who are not altogether ignorant of the process in which soda water is made are aware of this important fact. It is a fact evident that if soda water be left standing in the copper fountains for any length of time, even a day, it will become impregnated with the copper, especially if the fountain is not lined with tin. Dr. Doremus says "that a large portion of the soda water which he submitted to chemical examination was procured from obscure shops, where, it was presumed, the traffic was very limited." In such instances it is highly probable, simply from the important fact that it was limited to such an extent that it would not *pay* to have the fountains re-tinned every year, and new pipes re-fitted, therefore persons should be very cautious about drinking soda water at all such establishments. Persons who are fond of the beverage should, in all instances, get it from the more respectable establishments, where the trade is very large, as, for instance, I have known Messrs. \* \* \* \* \*, apothecaries, of St. Louis, to dispense from fifteen hundred to two thousand glasses per day. In an instance of this kind the soda water remains in the condenser only a very few hours, and it has been submitted to chemical examination and was found to be perfectly pure.

Dr. Doremus says, "that he was informed by a resident of St. Louis that, while the cholera prevailed, most persons abandoned the use of soda water. It was a common remark that Mr. — took a glass of soda water and was immediately attacked with cholera." This is all very true, but it was only when Mr. — took a glass of soda water at one of those obscure establishments which are very numerous in St. Louis.

EDWIN R. SWANN:

*St. Louis, Sept. 11th, 1854.*

REMARKS BY THE EDITOR.—In publishing the above letter it is with some doubts as to its utility, yet, as in the preceding number, page 422, we introduced the paper of Dr. Doremus, (which has called it out,) without comment, it is proposed now to add a few observations. The leading point in Mr. Swann's letter is, that soda water can only be obtained in good order from stores whose



reputation for the sale of the beverage enables them to dispose of it quickly, thereby tacitly admitting that even such stores are liable to, if not obliged to, employ apparatus unfit for the purpose, did not the short contact of the fluid render any ill effects from it impossible, and, of course, carrying the inference that in small establishments it would be almost impossible to prevent the sale of cupreous soda water. If this idea was acted on, consumers would be compelled to go to a few establishments for supply, on the penalty of being poisoned otherwise. Now we believe it is quite possible that good carbonic acid water can be furnished by vendors whose sales do not amount to more than one or two fountains per week, as we know by trial that in thoroughly tinned fountains, with proper tubes, etc., the water may be kept for weeks without cupreous impregnation. The difference all turns on the conscientiousness of the manufacturer in attending to the retinning of the fountains at proper intervals, and on the pharmacist in proper attention to the tubes, stop-cocks, and other portions of the apparatus belonging to him. There is no difficulty in ascertaining the condition of soda water if the apparatus is in fault. The addition of a few drops of solution of yellow prussiate of potash to a glass of the suspected soda water, placed on a white marble slab, or a sheet of paper, will occasion no change if pure, but if even a minute portion of copper is present, some shade of purplish brown will be manifest on looking down through the fluid, amounting, in many instances, to such a depth of color that the ferrocyanuret of copper separates in flocks. In order to ascertain whether it is the draw-cock, the cooler, or the fountain that is in fault, let the operator draw say half an ounce of the water from the tube connecting the draw-pipe with the cooler, then a portion from the cooler, and a third portion from the fountain directly. Let him then fill test tubes of equal dimensions with each specimen, and add a few drops of the test solution to each, as long as it causes coloration. By comparing the tubes, especially by looking down through the liquid with the tubes held on white paper, it can readily be seen which has the greatest depth of color, or whether the coloration is equal in all; if the latter, the fountain is probably most in fault; if the former, the fountain may be either less faulty, or in some cases faultless, in which instances the water drawn from it gives no coloration at all.



In our opinion mineral water should only be sold by persons who know how to test it and have the means at their disposal; hence apothecaries are, as a general rule, better qualified than confectioners, grocers and others; yet so extremely careless are some apothecaries of their apparatus, that often, without being aware of it, they vend cupreous mineral water and occasion inconvenience to their customers. The simple test above given should be known and regularly applied by all who sell this beverage; and as the apparatus used at most of the small dealers is owned by the manufacturers, and hired to the dealers, the latter should protect their reputations by insisting on having the water capable of standing the test above noticed after two days in use. We believe the source of the dissolved copper is more frequently in the cooler and stopcocks than in the fountains, and where these belong to the vendor of the water the remedy of course rests with himself.

As regards the use of tinned copper fountains there is no real objection, provided they are kept properly tinned. It would be a great improvement, if, as suggested by Dr. Doremus, these vessels were made in two sections or hemispheres, with flanges securely bolted together with gutta percha or gum-elastic packing between, so that the druggist himself could inspect their interior when desirable. The chief cause of the use of imperfectly tinned fountains is the expensiveness of re-tinning them, and the difficulty of inspecting their interior, owing to the solder joint. For the reason of its tenacity, durability and lightness, copper is greatly preferable to the other metals for this kind of apparatus where it has to be transported from the manufacturer to the retailer, and it is worthy the attention of our druggists and coppersmiths whether fountains cannot be eligibly constructed so as to be taken apart at will, and rejoined by bolts? We will suggest, as an improvement, that the lower section of the fountain be a cylindrical vessel strengthened by iron bands, with a hemispherical bottom, and furnished with a horizontal flange above. The upper portion to be a simple hemisphere of dimensions similar to the other, with a flange to fit that of the other portion, and the two brought together on a ring of gum elastic packing cloth, by means of a pair of ring clamps, with screw bolts, at intervals of three or four inches around their circumference. The stopcock should of course sur-

mount the upper hemisphere, and it would be well that the tube descending from it to the bottom of the fountain should be entirely of block tin, if it could be supported in any way compatible with the amount of motion and jarring to which the fountains are subjected during transportation. One difficulty in the way is the necessity of using brass stopcocks. Although the interior surface can be tinned it is more liable to become exposed and is more difficult to inspect than open surfaces. In reference to the tubing for connection there is no difficulty in having the short connection from the drawcock to the cooler of silver or, at least, of tin; but that from the fountain in the cellar to the cooler, a distance of seven to ten feet, the necessity for some substitute for lead is not so easily overcome. We have used gutta percha tubing for several years past, but it is liable to crack longitudinally near the connecting joint, and, at first, in the experience of some, gives a peculiar taste to the water, which, however, ceases by use; block tin is better, or lead lined with tin. Mr. Simes of this city, who we believe manufactures his own carbonic acid water, employs cast-iron fountains lined with enamel, which are unexceptionable, so far as we know, when they are not to be transported, their great weight rendering them ineligible in that case. Such fountains are hung on lateral pivots, like a cannon with its mouth up, which enables the operator to agitate their contents when desirable.

Although we do not think the sweeping remarks of Dr. Doremus are quite correct, yet we believe they will do good by directing the attention of the public, as well as the vendors, to the subject, and cause better arrangements to be adopted and more care exercised.

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#### REMARKS ON THE CALIFORNIA NUTMEG.

By PRO. JOSEPH CARSON.

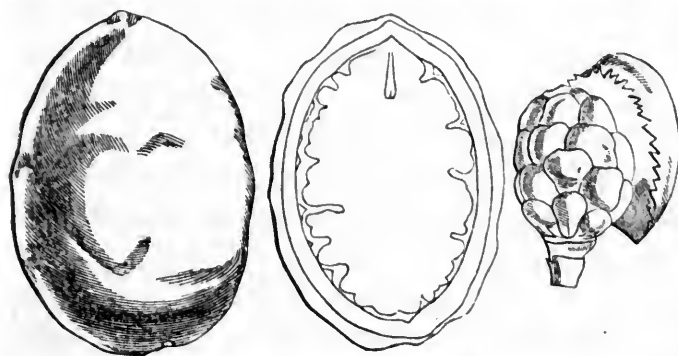
*September 15th, 1854.*

To Daniel B. Smith, Esq. :

DEAR SIR,—When last I saw you I promised to write to you upon a subject which then interested us, the so-called California nutmeg, which had been introduced into the market. I have since been enabled to examine thoroughly into the matter, and find that I was right in the statements made to you at the time, but engage-

ments and duties have prevented me from fulfilling my promise of communicating to you the result of further inquiries.

It is a singular circumstance that at the time of appearance in the Atlantic cities of the article referred to, another product, resembling a nutmeg, should have been accurately described, both in this country and England, a native of California. I refer to the fruit of the *Torreya Californica*, which has been described with the plant from which it is derived, by Prof. Torrey, in the N.Y. Journ. of Pharmacy, and transferred to the pages of the American Journal of Pharmacy, and which has simultaneously almost been described and figured



Fruit of *T. Californica* vel *Myristica*.

under the name of *Torreya myristica*, by Sir W. Jackson Hooker, in the Botanical Magazine. This fact has led to the mistake of attributing the drug in the market to

the same plant, and supposing it to be a true native Californian. Through the kindness of Dr. Torrey, I have examined the fruit of the *Torreya*, and find that it is to a certain extent similar, but at the same time so unlike as to lead to no difficulty in determining the true origin of either; the resemblance to a nutmeg which the fruit of Dr. Torrey's plant presents, is sufficiently remarkable to have given rise to the appellation "California nutmeg."

You will recollect I stated to you that in the nutmeg which had been introduced, I recognised an old acquaintance, having had specimens in my possession during nearly twenty years, which had been given to me by our late friend, Dr. R. E. Griffith, and by whom a reference had been made to it in his interesting Botanical Notices published in the early numbers of the Journal of Pharmacy. You will find it noticed in the 6th vol., page 22, under the name *Myristica tomentosa*. The inspection of this article, enclosed as it is in some of the specimens by its arillus, will show at once that it is a true *Myristica* and not a *Taxoid*. When conversing with Mr. Charles Wister, of Germantown, upon the subject, he told me that

this variety of nutmeg had been known to him for forty years, the first specimen he had seen having been brought from Calcutta by Dr. Bullock, so long ago as the period mentioned.

Dr. Wood, in the Dispensatory, has reference to the same article, when mentioning a kind of nutmeg which is distinguished from the common kind by its "much greater length, elliptical shape," &c., and states that it has been called *wild nutmeg*, the other being designated as *cultivated nutmeg*. In fact, it would seem that from time to time it has appeared as an article of commerce in small quantities, and had been overlooked by those who have recently encountered it under the promising title of California nutmeg. It certainly has been brought from that new section of the United States in company with the fruit that resembles it, and the only solution that presents itself to me of its appearance there, is that it may have been introduced by the Chinese who have sought the Pacific coast in quest of gold.

By referring to the section upon nutmegs, in the last edition of Pereira's *Elements of Materia Medica*, we find that the fruit under consideration has long attracted scientific curiosity; it is described and figured as the *long* or *wild nutmeg*. By the author mentioned, it is attributed to the *Myristica fatua*, Houtt, Blume. It is the *Nux moschata fructu oblongo* of C. Bauhin, and the *Nux myristica mas* of Clusius, a native of the Banda Isles.

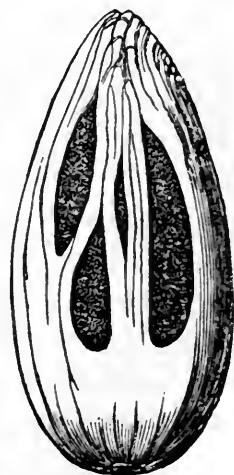
The fruit of this plant is "elongated, ellipsoidal rusty tomentose. Seed elongated, ellipsoidal, covered by a membranaceo-fleshy, orange colored, insipid arilloid, (mace); outer coat (testa) dark brown, hard; nucleus acerb, slightly aromatic, grayish ash colored, cylindrical, ellipsoidal, rugous, marked by a furrow." This description is accurate, with the exception of the flavor, both of the mace and kernel of the fruit, which may, however, vary in the samples that at different periods have been brought.

Hoping that the foregoing communication will satisfy you of the correctness of my conclusion,

I remain very sincerely,

Your friend,

J. CARSON.



Wild nutmeg.

## ON THE VOLATILE OIL OF ERIGERON CANADENSE.

BY WILLIAM PROCTER, JR.

This volatile oil has recently been introduced into medical practice by the "Eclectic" physicians, who esteem it for its medicinal powers. The specimen of the oil submitted to examination was labelled "Oil of Erigeron, American Chemical Institute, New York." It has a light straw color, is very limpid, has a peculiar aromatic, not unpleasant odor, somewhat analogous to oil of hemlock (*Abies canadensis*), which is extremely persistent; its taste is peculiar, mild and not very pungent. Its density very low, being according to the mean of two careful observations .845; it is very inflammable, burning with an abundant sooty flame, begins to boil at the temperature of 310° Fahr., and continues rising till 365°, showing that there must be two volatile oils. It distils *per se* unchanged and colorless, leaving a small oleo-resinous residue in the retort, which is probably oxidized oil. When a globule of potassium is thrown into the commercial or the recently distilled oil, it acts on it with the elimination of gaseous matter (hydrogen ?) from the entire surface of the globule, and the action continues until the metal disappears. The oil at first assumes a reddish brown color, which becomes deeper and finally causes a gelatinous residue, to separate which is probably a resinate of potassa. The oil is, therefore, highly oxygenous.

Hydrate of potassa acts on oil of erigeron slowly, turning it of a reddish color. Powdered iodine combines with it without explosion. Fuming nitric acid at ordinary temperatures acts slowly; but when heated explosively; sulphuric acid instantly decomposes it. The oil is very soluble in ether and anhydrous alcohol, but moderately in commercial (.835) alcohol.

The volatile oil of *Erigeron canadense*, when taken internally, acts as a stimulant carminative, like many of the milder volatile oils, but it is also said to possess a peculiar and efficient power as an anti-hæmorrhagic, especially in uterine hæmorrhage. It has been found useful (American Eclectic Dispensatory, page 451,) in diarrhœa, dysentery, hemoptysis, hematamesis, menorrhagia, and externally mixed with castor oil or stramonium ointment in hæmorrhoids.

The dose internally is from 4 to 10 drops, mixed with sugar and water. In uterine hæmorrhage the dose should be repeated at short intervals (10 or 15 minutes,) till relief is obtained.

## OIL OF WORMSEED.

MR. EDITOR,—I noticed a communication on oil of wormseed, in the last number of your Journal, by Samuel S. Garrigues, of Gottingen. He states, "two kinds of oil are found in the American market, one under the name of Baltimore, and the other called Western Wormseed Oil. Each is sold at a quite different price, though no difference can be found in their effects." Here he is in error; two druggists of this city years ago sent Baltimore seed to Ohio, where it was planted, and the product was distilled; the *first* crop had some resemblance to Baltimore oil, but the second far less, and the oil on a fair trial was found to possess much less anthelmintic power and pungency, as well as a different *flavor* from that raised in the vicinity of this city. Those druggists when the oil was *first* received from Ohio concluded it was equal in value to Baltimore, and sold it conscientiously under that impression, but by experience found and regretted their error.\* Vermifuge makers as well as physicians have tried the western, and found it to possess so little efficacy that they confine themselves exclusively to Baltimore oil. This peculiarity in soil with many plants is generally admitted. It is known that the best Havana tobacco comes from a certain district in Cuba, and if the seed is planted in our soil it degenerates in a few years to Maryland tobacco; and vice-versa, if Maryland seed be planted in Cuba. The *peculiar* strong flavor of Baltimore oil is never found in the western, neither is its pungency; and I believe had not western oil been introduced and sold by many of our druggists as equal to Baltimore, that the use of oil of wormseed would be prescribed at this day by physicians as an anthelmintic to a far greater extent than it now is. Previous to the introduction of the western it was prescribed here much more extensively than at present. I have thought it but just to send you those facts, &c., lest the publication of Mr. Garrigues' communication in your highly valued and extensively read journal should lead pharmacutists to coincide with his erroneous views.

A BALTIMORE SUBSCRIBER.

Baltimore, Sept. 29, 1854.

\* This information I had from them both personally within two weeks past.

## PHARMACEUTICAL NOTES AND GLEANINGS.

**HYDROCYANATE OF IRON.**—It has been stated in the medical journals, that “hydrocyanate of iron” had been used advantageously in epilepsy. Having been applied to for the salt, and being at a loss to determine what compound was intended, we consulted several authorities without satisfaction.

The dose, one or two grains, would indicate a more active substance than prussian blue. Hydrocyanate of potassa is synonymous with cyanide of potassium. Why not hydrocyanate of iron then be *cyanide of iron*? Gmelin says, (Handbook, vol vii., p. 432,) that “When aqueous cyanide of potassium is mixed with a ferrous salt free from ferric oxide, a light red brown precipitate is obtained, which dissolves in acids. The composition of this precipitate requires further investigation, but it is, perhaps, the true protocyanide of iron  $C_2 N Fe$ .” In attempting to dry this precipitate it assumes the color of prussian blue, by contact with the air during this process. By washing this precipitate with boiled water, and afterwards displacing most of the water from the particles by alcohol, and then drying, the same result occurred, viz., the whole mass gradually assumed a blue color, but not so deep as prussian blue. Hydrocyanic acid shaken with solution of carbonate of iron in carbonic acid water, forms a greenish oxide of iron, which turns blue by exposure to the air. There is a white cyanide of iron formed when aqueous sulphuretted hydrogen is agitated with finely-powdered prussian blue which converts it into protocyanide of iron; it, however, becomes blue by exposure. There is also a permanent cyanide of iron obtained when the ferrocyanide of ammonia is boiled in close vessels till the hydrocyanate of ammonia all sublimes, but it is insoluble in acids. It is to be regretted that medical writers, in referring to the therapeutic powers of new remedies, do not take more pains to identify the substances they have employed where any doubt may arise. We supplied the compound obtained by double decomposition between cyanide of potassium and protosulphate of iron, partially washed with alcohol, and dried in a jar over sulphuric acid, but have not yet learned whether it had the desired effect.—Ed.

**SULPHATE OF QUINIDINIA.**—Last year, Dr. William Pepper, Physician to the Pennsylvania Hospital, published an account of



the results of substituting sulphate of cinchona for sulphate of quinia in intermittent fever, and so successful did it prove that he has since continued to use it in his hospital practice. In April last, at the suggestion of Dr. Conrad, Dr. Pepper made a trial of *sulphate of quinidin* (the third alkaloid in cinchona bark,) in several cases of intermittent, with such decided success, that he is disposed to believe that quinidin is more active than either of the other alkaloids. These results corroborate a similar trial in two obstinate cases of intermittent, by Dr. Helfrick of this city, which had a like result. If these observations are supported by other testimony, we shall not hear of the rejection of cinchona barks because in the aggregate of alkaloids there happens to be *less than one per cent. of quinia*.—Ed.

MEDICAL STATISTICS.—According to the statistical tables of the census of 1850, there are in the United States and Territories, 40,564 Physicians, 191 Surgeons, 6,139 Apothecaries and Druggists, 465 Chemists, 2,923 Dentists, 10 Oculists, 59 Patent Medicine Makers, and 943 Professors. Of these, 1,060 Physicians, 54 Apothecaries, 8 Oculists, 563 Dentists, and 26 Nostrum Makers, are found in the State of New York alone, viz., one eighth of the physicians and one-sixth of the apothecaries.—*New York Med. Gazette*.

ANTIMONATE OF QUINIA.—Dr. La Camera, of Naples, has suggested the use of antimoniate of quinia, in intermittents, of great efficacy. The *Bulletin de Therapeutique* corroborates its merits and suggests further trials. This salt is supposed to embrace in its effects the resolvent and diaphoretic properties of the antimonials and the virtues of cinchona. “The dose of antimoniate of quinia is 12 or 15 grains, in broken doses, during the interval of remission.”—*Virginia Med. and Surg. Jour.*

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#### LEPTANDRIN—THE RESINOUS PRINCIPLE OF THE ROOT OF LEPTANDRA VIRGINICA.

(From the *American Eclectic Dispensatory*, page 595.)

Leptandrin may be prepared as follows:—Take of coarsely powdered Leptandra any quantity, alcohol 90 per cent., a sufficient quantity. By percolation obtain a saturated tincture. Place the tincture in a still and distil off the alcohol, and while

hot add the residuum, slowly and gradually, to cold water equal to two or three times its volume. Allow this to stand for seven or eight days, when the resinous matter will precipitate to the bottom of the vessel in a semi-fluid mass, while the water will hold in solution most of the extractive and coloring matter. Remove this water, and to the residue add a fresh supply of cold water, subjecting it to another washing. Then carefully remove the water, after having allowed all the resinous matter to precipitate, which last must be dried in shallow tin or porcelain plates, by a moderately-continued heat, until it becomes perfectly friable on cooling, and which generally requires several days. In the preparation of this article high-proof alcohol must be employed on account of the large amount of extractive matter present, which is soluble in water, and which ascending to the proportion of water employed, prevents the precipitation of the Leptandrin. Care must be taken, likewise, in the application of heat, as too great a heat, say above  $175^{\circ}$  to  $180^{\circ}$  F., will render the precipitate inert or materially affect its character. The above is the process usually employed in the preparation of Leptandrin; it may be obtained, however, by adding the tincture to four times its weight of water, distilling off the alcohol, and setting aside the residue for several days until all the Leptandrin precipitates. Remove the water and dry the precipitate as above, having previously worked it in fresh water to remove extractive, etc. Roots of the second year's growth are said to afford the most Leptandrin.

*History.*—Leptandrin, according to its mode of preparation is a jet black resinous substance resembling asphaltum, or of a greyish brown color, with a peculiar faint cyanic smell and taste, somewhat bitter but not disagreeable. In its aggregate it has a vitreous fracture, is unalterable in dry atmosphere, and is without acid or alkaline reactions. Its powder has a black, glistening soot-like appearance, and coalesces in a warm moist air. When first made, it is soluble in alcohol, though, as with many other resins when exposed to atmospheric influence, it becomes imperfectly soluble in alcohol, but perfectly so on the addition of aqua ammonia. It is insoluble in water, but the addition of liquid potassæ or ammonia renders it perfectly soluble, from which solution it is precipitated by acids. Ether takes up a

portion of it, and aqua ammonia added perfectly dissolves it, leaving the ether floating above it of a light reddish-yellow color. It is lighter than chloroform and insoluble in it. Spirits of turpentine takes up a small portion, forming a dirty white liquid; acetic acid likewise dissolves a small portion. None of the above agents have been tried with heat. Nitric acid turns Leptandrin of a brownish-yellow color, muriatic acid a light yellowish-green, and sulphuric acid reddish-brown. Heat semiliquefies it, and it burns with a bright light flame, giving out a sweet balsamic and rather agreeable odor, somewhat resembling balm of Gilead buds when burned as incense. This valuable agent was first prepared and introduced to the profession by W. S. Merrel, of Cincinnati.

*Properties.*—Leptandrin is a powerful cholagogue, with but slight laxative influence; except given in very large doses, its cathartic powers are but very feeble. It is one of the most efficacious and important agents among those peculiar to eclectic practice, being the only known medicine that efficiently stimulates and corrects the hepatic secretions, and functional derangement of the liver, without debilitating the system by copious alvine evacuations. It may be safely and efficaciously employed in the treatment of diarrhœa, cholera-infantum, some forms of dyspepsia, typhoid fever, and all diseases connected with biliary derangements. Combined with *podophyllin* it is a prompt and effectual remedy in epidemic dysentery, often effecting a permanent cure in from 12 to 18 hours: in dysentery with irritable bowels it may be used alone with advantage, or combined with camphor, as in such cases its union with podophyllin is contra-indicated. In intermittents it renders the action of quinia, when united with it, more certain, and prevents the liability to the return of the disease, at least for the season, and is likewise very beneficial in infantile remittent fever, and in periodical diseases generally, of an obstinate character, in which quinia alone seems to produce little or no result. It may also be used in many other combinations with much advantage, as with hydrastin or with beef's gall, in some dyspeptic affections, jaundice, piles, etc., or with iridin, baptisin, corydalin, caulophyllin, and other active principles, in various forms of the disease. Dose of Leptandrin, from one-half to five or six grains

every three or four hours, according to the action or the effect desired. Some practitioners neglect the use of this agent, because it does not act so powerfully as podophyllin, and hence lose the use of a very important remedy in functional derangement of the liver and other organs essential to digestion.

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## METALLIC WEALTH OF THE UNITED STATES.

BY J. D. WHITNEY.

In a work on this subject, recently published by Messrs. Lippincott, Grambo & Co., of this city, the author enters into a careful investigation of the mining interests of the United States in comparison with those of other countries. The following extract, summing up the production of metals, is taken from a notice of the work in Silliman's Journal for September, viz :

A general summary at the close of the volume is given, accompanied by a tabular statement of the estimated amount and value of metals produced throughout the world in 1854. The metals selected are gold, silver, mercury, tin copper, zinc, lead and iron. The aggregate of these are as follows :

Gold.	Silver.	Mercury.	Tin.	Copper.	Zinc.	Lead.	Iron.
lbs. troy.	lbs. troy.	lbs. av.	tons.	tons.	tons.	tons.	tons.
481,950	2,965,200	4,200,000	13,660	56,900	60,550	133,000	5,817,000

The product of the United States in gold is set down at 200,000 pounds, Australia and Oceanica at 150,000, and Russia at 60,000 Mexico and South America 47,100. Of silver, the New World supplies 2,473,700 pounds, leaving only the small residue of 491,500 lbs. for all other countries. Of mercury, Spain gives the world 2,500,000 lbs., and the United States 100,000 lbs. England and Australia furnish over half of all the copper produced by the world : the present product of the United States being in this metal only 3,500 tons. Prussia and Belgium furnish four-fifths of all the zinc used in the world (viz. 16,000+33,600 tons.) Lead is distributed between Great Britain, Spain and the United States in the ratio of 4, 2, 1 (viz. 61,000, 30,000 and 15,000 tons each.) England furnishes more than half the iron of the world, 3,000,000 tons, and the United States 1,000,000 tons. France is the next most productive country in iron, 600,000 tons. Russia produces but 200,000 tons, and Sweden 150,000 tons, quantities bearing a very small relation to the celebrity of product of those countries.

The following table exhibits the comparative value of the metallic productions of different countries, from which may be seen the ratio of their production, as compared, first, with that of this country taken as the unit, and, secondly, with that of Great Britain.

	Value of metals produced.	Ratio of production to that of	
		U. States.	Gr't. Britain.
United States, - - - - -	\$79,827,000	1.	5·6
Great Britain, - - - - -	96,169,800	1·205	·1
Australia, - - - - -	39,428,000	·494	5·12
Mexico, - - - - -	30,480,000	·382	1·3
Russian Empire, - - - - -	25,240,000	·316	1·6
France, - - - - -	15,252,500	·191	4·15
Chili, - - - - -	13,144,000	·165	2·15
Rest of South America, - - - - -	16,176,000	·203	1·6
Austrian Empire, - - - - -	11,708,000	·147	1·8
Prussia, - - - - -	9,680,000	·121	1·10
Belgium, - - - - -	9,375,000	·118	1·10
Spain, - - - - -	8,016,416	·100	1·12
Sweden and Norway, - - - - -	5,460,896	·068	1·17
Saxony, - - - - -	1,455,000	·018	1·67
Hartz, - - - - -	1,147,588	·014	1·86
Italy, - - - - -	832,500	·010	1·120
Switzerland, - - - - -	375,000	·005	1·240

The great importance of our own metallic resources will be at once apparent from an inspection of the above table. It will be seen that we are second only to Great Britain in our production, as we are also in our consumption of the metals. The two great Anglo-Saxon countries stand far before all others; and Australia, a colony of England of but a few years growth, is the next competitor on the list. As our production of gold which now forms so important an item of our metallic wealth, falls off, as it assuredly will, the deficiency may be more than made up by the development of our resources for the production of other metals.

#### ON THE MEDICINAL PROPERTIES OF THE COTYLEDONS OF SIMABA CEDRON.

By S. S. PURPLE, M. D.

In the September number of the New York Journal of Medicine, Dr. Purple has published a paper on the medicinal properties of cedron seeds, especially as regards their anti-periodic power as a substitute for quinine in intermittents. We have already noticed the history and botanical origin of these seeds, and the observations of Dr. Purple are too strictly medical and extended to transfer them to our pages; yet whilst referring

the reader to the *New York Journal of Medicine* for September, page 173, for the details, we copy the following closing remarks of the paper :

“From all that we can learn regarding its habitude and mode of procurement, we are led to believe that the only obstacle in the way of the use of cedron in medicine, is its apparently somewhat limited supply. We say apparent, for in a letter received from Dr. Magrath, we learn that ‘the cedron appears to be obtainable in quantity, with some little difficulty, from Carthagenæ; but a brisk demand, no doubt, would cause an equal supply.’ The history of all new medicinal agents, derived from savage or semi-civilized countries, teaches the fact, that at first, the remedy sought after is obtained with much difficulty; but we should not, from this cause alone, neglect to investigate or enquire into its uses; and should it, according to our belief, be found that this article possesses decided merit, and some advantages over quinine, we have no doubt but that some of our enterprising commercial druggists will find it to their interest to devise means for its introduction into our market.

Finally :—From the declared experience of various observers of the medicinal effects of the *Simaba cedron*, we are warranted in drawing the following conclusions regarding its therapeutic action :—

That it possesses decided anti-periodic properties, and is therefore applicable in the treatment of periodic diseases.

That it is less likely than quinine to produce the aggregate of encephalic or neuropathic phenomena, induced by overdoses.

That it may, in large doses, repeated often, produce griping of the bowels, and even diarrhœa; but that these conditions are easily controlled by appropriate medicaments.

That, as a remedy in intermittent fever, it possesses properties, in many respects, equal to quinine, and in most cases is equally adapted to the cure of this disease.

That, in the treatment of yellow fever, it does not appear to possess any particular advantages over quinine, but nevertheless is equally well adapted to fulfil the indications which call for the use of this latter remedy.

That it possesses marked tonic properties, and deserves a prominent place in this classification of the *Materia Medica*.

That in chronic dysentery, diarrhœa, dyspepsia, and all stages of the stomach, accompanied with impaired or difficult digestion, its use will be found to be attended with benefit.”

That, should a demand arise for its use in medicine, it is believed that it will be found not difficult to obtain a supply, in quantities sufficient to afford it at a much less price than quinine.

NEW YORK, *September 1st*, 1854.

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#### ON PANAQUILON, A NEW VEGETABLE SUBSTANCE.

By S. S. GARRIGUES, of Philadelphia.

Ginseng, the root of a kind of panax, is known in China as a very valuable medicine. In 1703, its existence was proved in the forests of Canada by Sarrasin, where it is known by the name of Otceraagweh. This American ginseng is the root *Panax quinquefolium*. It has a thickness from a quill to a finger, is only a few inches long, brownish yellow, generally finely ringed, internally yellowish white, spongy. Fresh it smells aromatic; but dry, only faintly so. To the taste it resembles liquorice root, with a disagreeable bitter after taste. It has been chemically examined by Rafinèsque, who stated that he found in it besides ordinary constituents, a camphor-like body, to which he gave the name of panacine. On account of the uncertainty of his statements, I have undertaken a fresh investigation of this root, and been fortunate to discover therein a peculiar matter, on which chiefly depends the taste, and, probably, the medicinal activity of this root. I propose for the name of this substance panaquilon.

A cold infusion of this root, prepared in a percolating apparatus, has a clear brown color and sweetish taste. It reacts acid. By heat a considerable coagulation of albumen is separated from it. If this is then filtered and considerably concentrated acids throw nothing down after cooling, which proves that it contains no glycyrrhizine, which might be expected from the sweet taste of this root at the beginning. To separate the panaquilon, I mixed, at the suggestion of Professor Wöhler, the syrup-like infusion with a saturated solution of sulphate of soda. Hereby a dense adhesive precipitate resulted, which was washed as much as possible with the salt solution, and then treated with absolute alcohol, which dissolved the panaquilon and left the sulphate of soda behind. The panaquilon remaining after the alcohol has been distilled off, is dissolved in water, treated with purified animal charcoal, the solution again evaporated, and the residue once more dissolved in absolute alcohol.



The panaquilon thus prepared is an amorphous yellow powder, which cannot be decolorized by animal charcoal. It is easily soluble in water and alcohol, but insoluble in ether. It has a taste resembling glycyrrhizine, but bitterish. By heat it fuses and is decomposed. It burns without residue. Its solution is not precipitated by acids or chlorides of mercury and platinum, but with tannin it affords a precipitate. By alkalies it is colored brown. Heated with caustic potash panaquilon gives no ammonia.

Three analyses made with this substance, dried at  $212^{\circ}$  Fahrenheit, gave results which in agreement with the behaviour of panaquilon below related, would lead to the following formula as expressing its composition  $C_{24} H_{25} O_{18}$ .

The behaviour of panaquilon towards strong acids is very characteristic. It is thereby under the separation of carbonic acid and water, converted into a white body insoluble in water, for which I propose the term panacon. By concentrated sulphuric, panaquilon is dissolved with a fine purple red color. If this solution is poured into water, a white precipitate results of panacon. By an especial research I convinced myself that this change is not accompanied with the formation of sugar. More simply, panacon is obtained when a concentrated solution of panaquilon is mixed with muriatic acid, or, at least, with nitric acid, and gently heated. Under a slight evolution of carbonic acid, panacon separates as a white powder, which fuses by heat under the liquid.

Panacon forms a white powder, appearing under the microscope crystalline. It is tasteless and insoluble in water and ether, but is dissolved by alcohol. With hot concentrated nitric acid it affords oxalic acid. Alkalies are without action upon it. In concentrated sulphuric acid it dissolves with a purple red color, from which it is precipitated white by water. It is very readily fusible, and burns with flame, and leaves no residue.

Two analyses afforded results which may be expressed by the formula  $C_{22} H_{19} O_8$ . This formula is founded on the assumption that by the formation of panacon from panaquilon, the elements of 2 atoms of carbonic acid and of 6 atoms of water separate from the latter.—*Annals of Pharmacy, from Annalen der Chemie.*

## ON THE PTEROCARPUS ERINACEUS, OR KINO TREE OF WEST AFRICA.

BY W. F. DANIELL, M. D., F. R. G. S.

Honorary Member of the Pharmaceutical Society.

IN conformity with the routine of garrison duties pertaining to the Gambia command, I became stationed, towards the close of 1852, at Janjamberri, or Macarthy's Island, a small military outpost established about two hundred and fifty miles inland from the embouchure of the river. This small island was advantageously situated between Pisanea and Kayi (the points from which the intrepid Mungo Park commenced his first and second explorations into Central Africa), and afforded a rich field for botanical and ethnological research. In former years the circumjacent localities, now denuded of their more valuable timber, were clothed by dense forests, from which considerable supplies were derived by the European traders at Bathurst, which consisted chiefly in what was termed in commercial parlance, African mahogany (*Ximenia Americana*?). With this mahogany was also felled another kind of wood, deemed of much less value in a mercantile point of view, and therefore seldom exported to England; yet, nevertheless, held in high request by the native communities for the purposes of house and boat-building, and other colonial appliances. By Europeans it was known under the name of *rosewood*; but the Mandingo, Joloff, and other aboriginal tribes, employed their own peculiar designation.

The latter of these trees on several occasions attracted my attention in consequence of its branches being entirely destitute of leaves and flowers, during the greater part of the dry season, while its greyish trunk was frequently tinged with ruby-colored exudations, which occasionally collected in small dark friable masses, on the abraded surfaces of the bark, and within the deeper interstices. A careful examination of the botanical character of this product, led me to infer that it was the *Pterocarpus erinaceus*, Lam., or true kino tree of West Africa, which an analytical investigation of the gum to some extent confirmed, inasmuch as it was apparently endowed with those characteristic properties, by which medical authorities had previously distinguished it.

At present, the information we possess respecting the early

history of this drug is so scanty, that it becomes necessary to enter into a detailed account of what has hitherto been published concerning it. Dr. Fothergill, so far back as 1757, seems to have been the first to describe the qualities of this gum kino, owing to the recommendation of a Dr. Oldfield, who termed it the true gum Senegal. He, however, remarked, that the title was somewhat objectionable, as the small quantity which had then been procured, had principally been derived from the river Gambia, and suggested, that if an application be bestowed on the gum in question, that of *Gummi rubrum astringens Gambiense*, would not be inappropriate. He also further observed, that the drug was purchased on board a Guinea ship at Hull, and amounted only to a few pounds in weight, which the purchaser vended to the most curious of his customers as a "rare sort of the true dragon's blood." This knowledge induced him to refer to the recent works of travellers in Western Africa: and in that of Moore, under a letter of instructions from the Governor of James's Fort to the author, who then resided at Bruko, a trading factory on the banks of the Upper Gambia, he found the following remarks: "There is a red liquor that bleeds plentifully from the bark of a tree called *Pau de Sangue* upon the incision, and in little time hardens to the consistence of gum, which is of great value, and therefore you are desired to use your utmost diligence to procure large quantities of it."\* Bruko is a small Foota-foulah town, located about two miles above Macarthy's Island, and the *Pterocarpus* or rosewood abundantly flourishes in its vicinage, and is the only production that yields any gum or wood of the hue that would merit the designation of *Pau de Sangue*. Moore, in reply, states that he sent a sample from Bruko, which proved to be gum dragon, and, moreover, writes in another letter, that the inhabitants of the district were accustomed to bring him various kinds of gum, amounting to ten or twelve pounds in weight, of this only two pounds were gum dragon, the remainder resembling gum Senegal of an inferior quality. He further observes that "gum dragon comes out of a tree called *Pau de Sangue*, which has a very rough

\* Med. Observ. and Inquiries, vol. i., p. 358; vide also Moore, as quoted in the same paper.

bark ; upon wounding it, it sweats out in drops like blood, which joining together and being dried by the sun, congeal into lumps. I have had some as large as pullet's eggs." There can be little doubt that the gum dragon here referred to, is the ruby-colored exudation from the *Pterocarpus*, and consequently the true kino, as the above description will be discovered to be closely applicable both to the cortex and its peculiar sap.

Dr. Winterbottom, for many years physician to the colony of Sierra Leone, upon his arrival in 1796, in England, introduced into his practice a species of bark procured from the Mandingo country, which Afzelius from its aspect surmised might belong to the genus *Rondeletia*. From subsequent inquiries, however, it was ascertained that his views were correct, inasmuch as the same cortical substance, from specimens since submitted to my examination, that pertained to the kino were evidently those that pertained to the kino tree. A remarkable circumstance tending to confirm this statement is, that the Foulah title of *Bellenda*, by which it was known in Sierra Leone, was precisely the same under which the Fouta foulahs of the Gambia recognized it. Dr. Winterbottom likewise furnished a brief outline of its medicinal virtues, and the diseases in which the native practitioners resorted to its exhibition, to be noticed in a future part of this paper.

During his second expedition into Central Africa in 1805, Mungo Park found the *Pterocarpus erinaceus* growing plentifully in the neighborhood of Pisanea, and transmitted the leaves and fruit to England, where they still exist in the botanical collection of the British Museum in a good state of preservation. The discovery, therefore, of the source of the original kino, can only be ascribed to this illustrious traveller.\*

\* I am indebted to the kindness of a distinguished botanist, Mr. J. J. Bennett, of the British Museum, for the following history of this plant. He remarks, that "the tree producing the true gum kino of commerce was unknown, until a branch in leaf, together with the fruit and gum, were transmitted to Sir Joseph Banks from Kayee, on the river Gambia, in 1805, by Mungo Park, during his last fatal expedition into the interior of Africa (vide Park's *Journal*, &c., Lond., 4to, 1815, p. lxi. and p. cxxiv). These specimens were immediately determined to belong to a species of *Pterocarpus*, at first presumed to be undescribed, but were subsequently referred by Dr. Brown (Vide Denham's *Narrative*, append., p. 235, note)

In their travels through Senegambia to Sierra Leone in 1817-19, Messrs. Gray and Dochart also met with this production, under the country name of *Kari*, the flowers and a leaf of which have been well delineated and described by Sir. W. Hooker, by the appellation *Pterocarpus Africanus*, or gum *Kari*, in the Appendix to their volume. Major Gray observed, that when incisions were made in the trunk and branches of the tree the juice flowed out, "at first of an extremely pale-red color, and in a very liquid state; but it soon coagulates, becoming of a deep blood-red hue, and so remarkably brittle, that its collection is attended with some difficulty."

The *Floræ Senegambiæ* of MM. Guillemain and Perottet, published in 1830-33, contains, however, the most correct outline of the *Pterocarpus erinaceus*. In their work the flowers, leaves, and other portions of the plant are truly figured, and afford an excellent representation of its botanical features. The characteristic description now appended has been taken from these authorities. I may remark, *en passant*, that the specimens of the kino tree brought from the Gambia by myself, when compared with those of Park, and the delineations of the above authors, leave but a slight doubt as to their identity, and manifestly indicate that all belong to the same production.

PTEROCARPUS, Linn. Lamck., D. C.

Sepala 5 in calycem 5 dentatum concreta. Petala 5 in corol-

to the *Pterocarpus erinacea* of Lamarek, (*Encyclopédia Méthodique, Botanique*, v., p. 728, and *Illustration des Genres*, t. 602, f. 4, fruit). In the same note, Mr. Brown also pointed out that *Pterocarpus Africanus* or *Senegalensis* of Sir W. Hooker in the appendix to Grey and Dochart's *Travels in Western Africa*, p. 395, t. D., was founded on the same plant and Messrs. Guillemain and Perottet have shown that the *Pterocarpus Adansonii* of Decandolle (*Prodromus* ii., p. 419) is in no respect distinct. These gentlemen have also (*Floræ Senegambiæ Tentamen*, i., p. 229, t. 54) given a detailed description of the tree, together with an excellent figure drawn by M. Decaisne, accompanied by some notes on the mode by which the gum is extracted, and on its pharmaceutical properties. In the Banksian herbarium at the British Museum, besides the specimens of Mungo Park, there are others of the leaves and fruit of the Mandingo '*kano*' collected by Mr. Pitman in 1850, and these are now completed by the addition of excellent specimens of the flowers."

lam papilionaceam disposita. Stamina 10, filamentis variegè inter se connexis. Legumen indehiscens, irregulare, suborbiculatum, alà cinctum, sapè varicosum, 1-2-spernum. Cotyledones crassiusculæ incurvæ. Radicula ad embryonis basim subinflexa.

Arbores aut arbusculæ inermes. Folia imparipinnata. Racemi axillares (*Char. ex D. C. Prodrom. 2, p. 418.*)

#### PTEROCARPUS ERINACEUS.

P. cortice succum proprium nigrescentem exudanti; foliolis 11—15 alternis ovato-oblongis, obtusit subemarginatisve, supernè glabris, subtùs densè et brevè tomentosis; staminibus 8—10 monadelphis aut irregulariter diadelphis; leguminibus orbiculatis membranaceis, in disco echinatis.

*Pterocarpus erinacea. Poiret in Lamck. Dict. 5., p. 728.*

*Illust., t. 502, f. 4 (fructus).*

*Pt. erinaceus, D. C., Prodrom. 2. p. 419.*

*Pt. Adansonii, D. C., l. c.*

*Pt. Senegalensis, Vahl ex Herb. Jussieu? Hook. in Gray's Travels in W. Africa, p. 395, t. D.*

Arbor 40—50 pedes circiter alta, ramosa; trunco nodoso, crasso; ramis divaricatis, teretibus, junioribus velutinis; ligno flavo-rubescenti; cortice griseo rimoso, succum proprium pallidè rubrum dein nigrescentem exsudanti. Folia impari pinnata; foliolis 11—15 alternis, distantibus, petiolulatis, ovato-oblongis, obtusis subemarginatisve, margine undulatus, supernè glabris viribus, subtùs brevissimè et densè tomentosis pallidioribus, nervo medio prominulo nervulisque lateralibus parallelis, instructis; junioribus rufo-sericeis, adultis 2—3 poll. longis  $1\frac{1}{2}$  poll. latis. Stipulæ lanceolatae cauli appressæ, villosæ, circiter 3 lin longæ cito deciduæ. Flores in ramis vetustis infrà foliorum gemmas nascentes, paniculati, flavi, bracteolulati, pedunculis teretibus rachi foliorum brevioribus, tomento brevi rufoque onustis, singulo pedicello 3 flores gerenti. Calyx companulatus, hinc gibbosulus, densè velutinus 5-dentatus, subbilabiatus. Corolla papilionacea, flava; vexillo reflexo subrotundo, apice emarginato, margine subundulato, unguiculato, costâ nigrâ longitudinaliter notato; alis subspathulatis læviter arcuatis, longè unguiculatis, hinc auriculâ brevi obtusâ basi instructis, vexillum paulò superantibus; carinâ vexillo alisque brevioribus, petalis 2 alis consimilibus basi

liberis dorso tantum connatis composita. Stamina 8—10 monodelpha, intursum inaequaliter diadelphica, nempe in 2 phalanges divisa, aut 1 filamentum ferè ad basin segregato, cæteris inaequaliter connatis; antheris ovato-oblongis, dorso affixis. Ovarium lanceolatum, apice sinuosum, villosum biovulatum stylo glabro incurvo et stigmate capitato terminatum, ovulis longitudinaliter affixis. Legumen indehiscens, stipitatum compressum, membranaceum brevè velutinum, margine undulatum, mucrone brevi (stylo vestigio) lateraliter instructum, in disci centre inflatum, ubique setis rigidis spinescentibus, rufescentibus onustum, biloculare, interdum abortu uniloculare; loculis monospermis, dissepimento transversali sejunctis. Semen subreniforme, compressum, fuscum, nitidum, cotyledonibus crassiusculis radicula brevi accumbenti.

Floret Februario et Martio; fructus maturescunt Maio et Juno. (*Flor. Senegamb.*, p. 228-9, tab. 54.)

Although this species of *Pterocarpus* may be found growing more or less commonly in many districts of the Senegal, Nunez, and other streams of West Africa, and is probably indigenous to most of the inland regions through which they wander, yet the Gambia appears to be chiefly the *locale* where it most exuberantly flourishes. On the upper banks of this river, particularly where the kingdoms of Kataba and Nany border its course, and at Kayi, Lamain, Pisanea, and the adjacent countries, this production can be constantly met with, and in fact constitutes one of the ordinary forest trees. Prior to the occupation of Macarthy's Island, the site on which the town was erected was so thickly covered by this wood as to render the clearance difficult. The settlers, however, soon ascertained the value, and by their use of it in different kinds of wooden-work, for beams, firewood, and in the construction of their houses, gradually diminished its propinquity, so that in the course of a few years it became almost extirpated, and has, with a few exceptions, now disappeared from the island.

The tree varies in altitude according to the situation; in some places rarely exceeding forty feet, while in others more favorably adapted for its growth, the elevation it attains is seventy feet and upwards. The branches are spreading and somewhat tortuous, and are clothed with light green leaves, which make their



appearance at the end of April or early in May. They again disappear in October and November, and are not seen during the intervening period, or until the ensuing spring. Numerous papilionaceous flowers of a light yellow tint, emitting a delicate odor, nearly resembling that of the cowslip (*Primula veris*), and diffusing a delightful fragrance throughout the surrounding atmosphere, may be observed in the months of February and March, at the period when the branches are entirely deprived of leaves, and previous to the commencement of their budding. The fruit, a small orbicular pod, is covered with bristles, and ripens in June and July. The trunk is invested with a greyish-colored bark of various shades, which, as the tree advances towards maturity, becomes deeply corrugated, and broken into irregular longitudinal fissures, transversely intersected at intervals by others of less length but more superficial, so as to leave isolated projections or excrescences. The inner surface is smooth, of a deep red color, with longitudinal fibres, cemented throughout their extent, and partially saturated by the gummiferous principle, which invariably issues forth wheresoever the bark has been wounded or removed from the tree. This portion of the cortical substance, when chewed, leaves a pleasant aromatic and astringent effect on the palate, that remains for a considerable time. It is, therefore, between this and the exterior layer, that the liquid kino is most plentiful.

The gum, when it naturally exudes, is in limited quantities between the crevices of the bark, and cannot be readily detected on account of the external crust being black, and unless the cortex has been purposely abraded or incised with the view of obtaining a larger amount, is likewise somewhat difficult of collection. The exudation, as it first appears, is of a pale and dirty reddish hue, more copious and of greater liquidity, if the younger branches or twigs are cut. This gradually darkens in color in proportion as it becomes exposed to the air, and as the exsiccation is effected, assumes a ruby tint, which time deepens more and more.

In general, the African kino oozes forth in very superficial layers, remarkably friable and brittle, and adheres with such tenacity to the abraded surfaces, that it is almost impossible to procure any quantity without being conjoined with a portion of the wooden fibre. Hence the gum will always be found to have

minute fragments of wood, more or less united with it, and this circumstance has already been noticed by several writers who have given a description of those samples which had formerly been transmitted to England. Owing to its extreme brittleness, whensoever the larger masses are fractured, the fragments are necessarily small and pulverulent, inodorous, of an irregular angular form, those from the interior being shining, and of a deep ruby color, ultimately acquiring a brownish shade by atmospheric exposure. Kino has a peculiar grittiness and flavor when first tasted, combined with a certain degree of aromatic sweetness, not immediately perceptible, and distinct from the rough and astringent action it subsequently exerts on the membranes of the mouth. The most propitious time for procuring this gum is in the months of March and April, from trees of moderate dimensions. These are to be selected principally, since in them the sap is more abundant, and consequently affords a larger supply than others. The means most efficient to facilitate its exudation is by a number of transverse incisions or abrasions in the bark, a few feet from the ground.

The generic title of *Pterocarpus* has been obtained from the Greek words *πτερον* a wing, and *καρπος* a fruit, in consequence of the pods being encircled by a broad wing; and that of *erina-ceus*, the Latin name for the hedgehog, from the numerous bristles that protect them, and which have been supposed to bear some resemblance to those of this animal. Hence the English denomination of the hedgehog fruited *Pterocarpus*. The Mandingo designation for the kino tree in the Gambia is *Káno*, that of the Woloffs *Waine*, and the Foulahs *Bellenda*. Various other appellations have been conferred upon it in different countries, the Mandingoes, in the vicinity of Sierra Leone, terming it *Bembee*, the Soosus *Bimbi*, while in several regions of Senegambia it is recognized by that of *Kari*. The origin of the term *kino* is involved in some doubt. The late Dr. Pereira remarks that he has been unable to trace its derivation, but considers that the Hindu name of *Kuenee* or *Kueni* may probably be its source.\* Dr. Royle has long been of opinion that it was likewise taken from *Kuenee* or *Kini*, applied to a similar exu-

\* Elements of Materia Medica, vol. ii., part 2, p. 1841.

dation from the *Butea Frondosa*.\* A more reasonable probability, however, exists that it was derived from the Mandingo *Káno* or *Keno*, under which name it was first sold to the European traders by the natives, and exported by them by this aboriginal expression, and subsequently retained as a means of distinction from other kinds of gum brought from the same localities.†

Although previously employed by Dr. Oldfield, yet the merits of the introduction of African kino as a remedial agent into this country must be conceded to Dr. Fothergill, who exhibited it with advantage in chronic diarrhœas, fluor albus, and such diseases as proceeded from relaxation. Dr. Winterbottom seems only to have known the bark of the tree, from the fact of his obtaining a quantity from the Rio Nunez, where it had been given with great success in an epidemic dysentery prevalent amongst the inmates of the slave factories in that river. After his arrival in London he furnished Dr. Willan with samples, "who made a trial of it in agues, fevers, sore throat, and dysentery, very much to his satisfaction."‡ Under the title of "African Bark" in the same volumes he has compiled an elaborate account of its properties, with a series of experiments instituted on it, which in the form of a decoction was resorted to in cases of African diarrhœa, where opiates and astringents were indicated, and that it proved sufficiently grateful to the stomach to have the desired effect. Independently of the testimony of different physicians, he also adduces several instances of intermittent and other fevers in England, wherein it afforded proof of considerable febrifuge powers from the beneficial effects that followed its administration.§

Park, in his last journal, merely alludes to the ashes of the bark of the kino tree being used as a flux for the smelting of iron, and that he was informed by the natives if he swallowed them he would certainly die.|| Park, however, might have been

\* Manual of Materia Medica, p. 371.

† Vide Park's Letter in Journal, p. lxi.

‡ History of the Native Africans, vol. ii. p. 46.

§ Op. id., vol. ii., App. 2, p. 43:

|| Vide Journal, p. 49.

misinformed. The Mandingoes usually have recourse to the wood of the *Fillea Suaveolens*, Gill. et Per., for this purpose, which is thoroughly endowed with poisonous qualities; and it was perhaps to the cortical debris from this tree they alluded, as that of the *Pterocarpus* is considered innocuous.

The authors of the *Flore Senegambie* observe, with reference to this gum:—"Nous ne l'avons pas vu extraire pour les usages Pharmaceutique sur le bords de la Gambie."\* Notwithstanding this statement, various medicinal preparations of the gum and bark in combination are exhibited for the cure of certain endemic maladies by the Mandingoes and the Foulahs, in Yany, Bondu, and other inland regions of this division of Western Africa.

During the period I was in medical charge of the troops stationed at Macarthy's Island, I witnessed, on several occasions, the favorable effects of the powdered gum in checking the mucous diarrhœas, and other debilitated conditions of the intestinal canal, to which the inhabitants of these swampy localities are so subject. The bark, independently of its ordinary astringent properties, also exerts a powerful stimulant and tonic influence on the human frame. Observing that it occasionally constituted an ingredient in some of the medical compounds of the natives, I was induced to try it separately in a few cases of local remittent fever, complicated with relaxation of the bowels, as a gargle in salivation, and in other minor affections proceeding from a general atony or depression of the system, and with advantageous results. From these limited data I was led to conclude that this part of the kino tree might not unfrequently be found valuable in the treatment of a greater number of febrile diseases, attended with an adynamic state of the chylo-poietic viscera, common to the negro races, where quinine or other tonic remedies are inadmissible, or not readily attainable, and possibly may be the means of affording relief to those unfortunate travellers who, when destitute of medical resources, are compelled to experience all the baneful and pestilential vicissitudes of an African clime.—*Pharm. Jour. Aug. 1854.*

\* Id. op. ubi supra, p. 230.

METHOD OF RAPIDLY BLEACHING WAX, AND PURIFYING  
TALLOW, OILS, &c.

Wax, properly speaking, consists of pure wax and a coloring matter; there are several kinds of wax, distinguished commercially by the relative amount of coloring matter which they contain. Formerly it was supposed that wax could only be bleached by the action of sunlight; to effect this object, the operations could only be commenced in the month of May, when the fine season has set in, and the sun attained sufficient altitude to send its rays more directly, for a longer period and with more force; and these conditions continue only at most for three or four months. To bleach wax by this process, it must be made into ribbons of great tenuity, or feathered as zinc is by being poured into water; an operation which must be repeated at least three times, whilst the duration of the exposure to the sunlight must occupy from one month to six weeks, in order to destroy the coloring matter to which we have alluded. To do this requires a considerable space, which is often very expensive, and a heavy outlay in plant, such as bleaching frames, canvas, &c.; this primitive condition of the wax industry renders the bleaching not only embarrassing, but uncertain and variable according to the weather.

In order to diminish the amount of capital which was required to be sunk in this branch of trade, and above all to shorten the time required to bleach the wax, M. Cassgrand, some years ago, patented a process in France, which has now passed into the public domain, and which, it appears, has been very successful.

This process consists in melting the wax by means of steam until it becomes very liquid, and then passing it, along with the steam, through a kind of serpentine or worm, by which a large surface becomes exposed to the action of the steam. After traversing the worm, it is received into a double bottom heated by steam, where water is added in order to wash it; from this it is elevated by a pump, kept hot by steam, into another pan similarly heated, and where it is also treated with water, and is again passed through the serpentine. This operation is repeated twice, thrice or four times, according to the quality of the wax; during the passage with the steam through the worm, it becomes denser by, it is said, absorbing water (perhaps mechanically?),

and deposits in the upper pan. It is allowed to repose in this for about four or five minutes after each passage; and after the last one, about one or two hours, according to quantity, in order to allow of any impurities to subside. The wax is then granulated in the ordinary way by means of cold water, is allowed to dry during two or three days, and the action of light and air does the rest, for which one person is sufficient. The whole of the operations do not require more than a few days, are perfectly certain, and are attended with no danger. Independent of the advantage which such an apparatus has for bleaching wax, it has also that of enabling its qualities, according to relative whiteness, to be distinguished; for this purpose it is necessary to present the wax in mass to the end of the worm, and in a second or two the vapor determines the relative color which it will yield.

This process is also applicable to the purification of tallows and of oils; even fish-oil, when passed through the apparatus of M. Cassgrand, and washed as just described, is completely deprived of its disagreeable smell; and if it be set aside in a place where the temperature only reaches from  $59^{\circ}$  to  $68^{\circ}$  F., a fresh deposit will form, and the oil will become perfectly clarified and nearly colorless.

This process has considerable analogy with one which Mr. Dixon, of Dublin, patented some time since for bleaching palm-oil, the principle of which was exposing the oil to the action of steam. Cassgrand's apparatus might, no doubt, be applied to the same purpose, and appears to us to have certain advantages over that of Dixon, especially in exposing a larger surface to the action of the steam, and varying that surface oftener. If not already known here, the process is worthy of the serious attention of soap-boilers. Such a method would evidently be much more effective than the present system of purifying oils, especially where sulphuric acid is used, which is almost universally the case. As that acid is scarcely ever effectively removed, many samples of trotter, rape and other similar oils, are usually quite acid; where the former is used for the manufacture of hair-oil, it is very destructive to the hair, and the latter destroys the lamps when used for burning, &c. The only modification required for the purification of oil would be to divide the oil as much as possible by means of a diaphragm of copper, pierced with holes, in the

first steam vessel, and thus expose the largest possible surface to the action of the steam in flowing through the pierced diaphragm into the worm.—*Chemical Gazette, August, 1854, from Dublin Journal of Industrial Progress.*

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## ON THE DETECTION OF ALCOHOL IN JUDICIAL INVESTIGATIONS.

By DR. ED. STRAUCH.

Thomson has recommended the use of chromic acid for the detection of alcohol. The author confirms the distinctness of the reaction by reduction, formation of aldehyde, &c., but points out the inaccuracies which may arise from the reduction being also caused by many other bodies, although these affect less the distillate.

The essential portion of the author's communication is the following description of a method of determining alcohol by means of platinum, which enables us to decide within a quarter to half an hour whether the distillate of the substance under examination for alcohol contains that body or not.

The part of the body to be examined for alcohol is to be finely divided immediately after it has been taken out of the corpse; or if the test cannot be immediately applied, it must be placed in a well-closed vessel, in order to prevent the volatilization of any alcohol that may be contained in it. If the substance under investigation have an acid reaction, a few drops of very dilute solution of potash are carefully added to it until a piece of litmus-paper dipped into the mixture is no longer reddened. The substance is then put into a tubulated retort, either by means of a funnel or a pair of forceps. This may be of such a size as to hold about 1 lb. of water. For smaller quantities smaller retorts may be made use of, but it is always well to use as much as possible of the substance to be tested. If it be desired to detect alcohol in the lungs, the retort must only be half-filled, as the lungs when heated froth very much, and by this means a portion of the mass in the retort may boil over. The retort is placed in a water-bath, and so arranged that its neck may be but little bent down. This is broken off so far up that a tray of platinum, fine silver or glass, of about  $\frac{1}{3}$ rd of an inch in breadth and 2



inches long, may be slipped into it. Into this tray some platinum-black is put, and at each end of it is placed a piece of blue litmus-paper moistened with distilled water, which must be partially in contact with the platinum-black. The tray is now pushed, by means of a wire hook, to the place where the neck of the retort passes into its belly, and the water-bath is heated by means of a spirit-lamp. The operation may be facilitated by filling the water-bath with a solution of chloride of calcium or sodium, instead of water. As alcohol boils at a lower temperature than water, it of course is the first to be driven off. As soon, therefore, as the first water-drops begin to condense in the neck of the retort, that portion of the litmus-paper which is in contact with the platinum-black becomes reddened, whilst that portion which is turned towards the belly of the retort still remains blue, and thus at once shows that the acid did not come out of the retort, but was only formed in contact with the platinum-black. When the heat has been applied for some time, and single drops begin to run from the neck of the retort, without any reddening of the litmus-paper, we may conclude with certainty that no trace of alcohol was contained in the substance under examination. But if, on the contrary, the litmus-paper is quickly and strongly reddened, and it is desired to produce further proof of the presence of alcohol, the tray is again to be drawn out of the neck of the retort; the latter is then bent down a little more, a receiver is attached to it, and distillation is continued, until the distillate amounts to several drachms, during which the receiver is cooled by a cloth soaked in cold water. The distillate is then transferred into a small retort, and about the same quantity of fused chloride of calcium; or if this be not at hand, well-dried chloride of sodium is added to it. This retort is then put upon the water bath in pure water, a receiver is attached to it, and distillation continued as long as anything passes over. A few drops of this second distillate may now be added to a mixture of bichromate of potash and sulphuric acid, to obtain the alcoholic reaction. • The remainder of the distillate may be made use of to ascertain the specific gravity; but this, when operating upon such small quantities, not only requires fine apparatus, but also much skill, and must consequently often remain undone. A portion of the fluid may afterwards be poured into a metallic or por-

celain capsule, when its ignition by means of a burning match may be attempted. If this does not succeed, the capsule may be heated by a spirit-lamp, when the alcohol contained in the water is the first to evaporate, and may be ignited by a burning match. A portion of the distillate may be set aside; and if a considerable quantity still remains, the following experiment may be made with it. The neck of a small glass funnel is loosely closed by means of a small glass rod; some platinum-black is then put into the funnel, moistened with a few drops of distilled water, and the alcoholic fluid is then allowed to flow upon it in a very slow stream by means of a cotton thread, which may act as a siphon. A fluid, with an acid reaction, then drops from the funnel; this is carefully neutralized by a few drops of very dilute solution of potash, and evaporated to perfect dryness on the water-bath. A portion of the residue may be added to some very dilute chloride of iron, to obtain the ordinary reaction of the acetates; another portion may be triturated with a small quantity of arsenious acid, and heated in a small test-tube, when the characteristic strong odor of oxide of kakodyle is produced. These two latter tests, however, require rather larger quantities of acetic acid before they will succeed; as a general rule, the test with the platinum-black, to which the reaction with chromic acid and the test of combustibility may be added, is quite sufficient.

The platinum-black employed for this purpose is precipitated from a very dilute solution of chloride of platinum by means of zinc; it is washed first with muriatic acid, then with nitric acid, and lastly with potash. The author concludes with a series of experiments, which sufficiently prove the applicability of the method.—*Chemical Gazette*, August, 1854, from Strauch's *Inaugural Dissertation*, Dorpat, 1852.

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#### ON THE RECOGNITION OF BLOOD-SPOTS UPON LINEN AND COTTON STUFFS.

By C. WIEHR.

In the course of last year the author had to examine some pieces of stuffs which bore red spots; these were a dirty old piece of coarse unbleached linen and a blue and white checked pillow-cover. The object was to ascertain whether the red spots upon them were produced by blood.

With this object, a red fragment was cut out of each piece of

stuff, and each fragment extracted separately with distilled water. The spots on the coarse cloth had already begun to decompose, as it had lain a long time buried in dung. The filtered fluid from it had a dingy brownish-red color. By the employment of the reagents, such as liquid chlorine, ammonia, nitric acid and tincture of galls, which are particularly adapted for the detection of albumen, the proper reactions were certainly obtained; but as the fluid was not of a pure red color, they were not so distinct as to enable the presence of blood to be determined with perfect certainty. With the second fluid from the pillow-cover, which had a dark violet color, from the bad blue which was produced by logwood, these reagents could not be employed. The author endeavored to produce cyanide of potassium with the supposed blood-spots of these stuffs. For this purpose, having first ascertained, in a well-known manner, that they contained no wool, he roasted a red fragment of the coarse linen in a porcelain crucible until it could be rubbed to powder; this powder was mixed with some carbonate of potash, and strongly heated to redness. The calcined mixture was extracted with distilled water, and a little solution of a salt of protoxide, and another of peroxide of iron, mixed with the filtered fluid, by which means a precipitate of indeterminate color, consisting of protoxide and peroxide of iron, precipitated by the excess of carbonate of potash and protopercyanide of iron, was produced. A little dilute sulphuric acid was now added, by which the oxides of iron were dissolved; whilst, on the other hand, the protopercyanide of iron, which is insoluble in sulphuric acid, made its appearance with its blue color. The same result was obtained with a piece of the checked stuff on which red spots existed, but not with fragments of the stuffs which presented no appearance of blood-spots.

The experiments were also frequently repeated with other blood, and furnished satisfactory results even with the smallest quantities.

The operation also succeeds when a piece of stuff spotted with blood is boiled with solution of caustic potash, the fluid evaporated to dryness and calcined, and then treated with iron salts and sulphuric acid. This method may also be employed when blood-spots are found upon metallic objects; the spots are dissolved from the metal by solution of potash.—*Chemical Gazette*, August, 1854, from *Archiv. der Pharm.*, lxxviii. p. 21.

## STUDY.

BY MR. JOSEPH INCE.

Half the intellect of London has arrived there with a few shillings and a carpet-bag. Its great writers, statesmen, merchants, adventurers of every kind, down to its great Chemists, have travelled on the same stage-coach. Family distress, narrowed opportunities, and sometimes actual want, have been the best heritage of many of our illustrious men. It is for us with a laudable ambition to follow their example, and to act in our turn as they have done before; in furtherance of which object a theory is offered, and its practical results worked out, addressed exclusively to those assistants who have little time, no competent advisers, and no friends. Such an one on first being introduced to the subject, would infallibly remark, "These excellent discourses read very nice on paper, difficulties surmounted make great men, but I am nothing but a Druggist's assistant; I have early and late hours, while my time is not my own. The tide of fortune might roll my way in vain, for I have business to attend to, pills to roll out, and physic to make up. Besides, I have a strong notion that retail Pharmacy contracts the mind; drugs and success in life form no amalgam. If some good friend would kindly leave me a legacy, or people have no medicine after eight o'clock, I might perhaps then read a little, do something, and improve." Of course after this statement you naturally feel better, so now will you just let me give you my quiet mind. What makes success? and who are the men who gain it? Every one knows who fail. Give a man plenty of time and sufficient money, and he will in general make no use of the first, and waste the second. Great natural opportunities, an easy access to society, friends, a crowd of teachers, a ready-made position involving no struggle, and no anxiety, shut out for ever the most distant hope of extrication from such a Capuan luxury. It is a fatality to be born with white kid gloves. To all this there are bright exceptions, but so few that they only prove the rule, nor do these remarks apply to hereditary rank, where habitual cultivation and contact with elevating circumstances produce noble specimens to the contrary. The past is the great teacher for the present, nor is there a more consoling thought, than

that what man has done, man may do. Physic has not the contracting influence you imagine. An assistant like yourself, while in a suburban district, managed to become as brilliant in literature as he now is high in law, and it needs some self-denial, on the part of the writer, to refrain from citing endless instances.

So much for intellect. Infinitely more to the purpose it is to know, that those who never left their original calling, succeeded in it with no greater advantages than you possess. The names best known are the most appropriate illustrations, though personal mention would be both invidious and indelicate. All first-class Chemists' establishments are now so interwoven and associated with daily city life, that each separate firm, with its owner and reputation, seems part of the current course of events. But there was a time when these very houses were not in existence. Their directors were hard-working, persevering, determined assistants, with not a tithe of the advantages of the present day. Education had to be dug up. The scanty Latin of their youth was mystified in an unintelligible grammar, which has only been swept away within the last few years. Greek was considered a language well adapted to the Athenians, and an austere schoolmaster who taught for his salary, was not likely to awaken a strong interest in general knowledge. After this pleasant commencement, the young beginner was apprenticed to a Chemist, because his parents thought it *such a nice clean business*; accordingly, the Tyro found himself immediately smothered up to his eyes in white, red, and blue paint, not unlike the clown at Astley's, happy to present himself to society, not too redolent of varnish, and, having escaped the oil-can on the one side, and the black-lead on the other, allow a comprehensive apron to cover all deficiencies for seven long years. He then came to London. No institution taught him anything, no good and cheap books instructed him. There were museums for surgery, anatomy, and geology, but none for him; there was less time than there now is, and rougher work. What then? The battle of life was before him, and he won it. Success, almost barricaded, was carried by assault. Fame was not an heirloom in the family, it was gained slowly but surely. The shop, though draughty enough in all conscience, was never favored by some special gale from heaven which swept in the

customers, advertised the drugs, and improvised a reputation, yet somehow or other the new house and its owner by degrees gained itself a name, passed into a household word, and became as well known as St. Paul's Cathedral.

Study was the talisman which wrought the enchantment. One hour a day devoted for three years to regular, uninterrupted, systematic reading would enable you to reach the limits of your ambition. Three years! what an age! But unimproved or not they *will* go all the same, so why not make the best of them in passing? The sole question is, can you get one hour? Such is the internal constitution of some houses that it is quite impossible. On this subject we are fearful of being led astray by temporary excitement, which would gain no object, but simply create annoyance. We believe it to be the interest of none but the gas companies to commence business before the day-dawn, and protract it beyond the dead of night. It is the interest of masters to have the cordial sympathy of their assistants, and not their unwilling services. It is the interest of the public to be served by an intelligent being, and not by a spectral incompetent. It is the interest of the assistants to have the requisite time for improvement here, and the opportunity for attending those sacred duties which are to fit them for hereafter.

Now for a few practical details:—Ten pages can be well read in one hour. “Why bless us all, I can read fifty without the slightest trouble—thirty at least.” In “bless-us-all gentlemen” we have little confidence; the first month finds them at work like a steam-engine, the second at the bottom of their beds. They are like those remarkable young ladies who *learn* French in three months, pick up Italian on their way, and take German at a hand-gallop—a process which causes a slight embarrassment to the respective natives.

Returning to the decimal system, which is after all the best, a short tabular view may tend to enlighten the subject. One month contains in round numbers thirty days, consequently ten pages every morning would be 300 pages a month, from which the following *average* result might ensue:—

Pereira's Materia Medica	. 1900 pages	6 months.
London Pharmacopœia	. 550 “	2 “
Christison's Dispensatory	. 950 “	3 “

Thomson's Dispensatory	. 1150	"	4 months.
Brande's Chemistry	. . 1500	"	5 "
Turner and Liebig	. . . 1240	"	4 "

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2 years.

The whole of these are books of general reference.

Supposing that one hour would only master six pages a day of Chemical works requiring more than ordinary attention, then 180 pages would be read each month, and 2160 pages in a year, which would include the following:—

Fownes' Chemistry	. . . 550	pages.
Gregory's Outlines	. . . 560	"
Royle's Materia Medica	. . . 700	"
Fresenius' Analysis	. . . 350	"

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2160

Nothing now remains to make this table accurate but to correct for pressure of time and density of head.

It will not be supposed for a moment that the mere reading of these books will constitute a well-grounded acquaintance with their contents, but the list shows that there is a possibility of accomplishing far more than is generally supposed in a very limited space of time. Few, indeed, would have courage to drag through some of the ponderous volumes enumerated, nor would such a herculean task be advisable. Such calculations are necessarily imperfect, though useful, as there may be interfering circumstances, over which there is no control. Sickness will sometimes throw its shadow over the brightest hopes. It may be a fancy, but we have always felt the toilsome nature of unassociated Chemistry, and therefore suggest the following plan:—

Allow one hour, every other day, to the consecutive continuous reading of *one* outline work, by which means you would triumph over 150 pages a month, and 1800 pages in the year.

It is usually desirable not to pore over the same manual too often, after having once carefully perused it, but to commence another, which, though treating on the same subject, is expressed in different words. There are few introductory treatises of more than 600 pages each.



At the same time it is well to know that an occasional dip into one book, varied by a short reading of another, a snatch of Brande, a glance at Daniell, a look into Fownes, and a general survey of Gmelin, Parkes, or Faraday, will consume the same amount of time, and lead to nothing.

No one can hide from himself the absolute necessity at the present day of being acquainted with at least the elements of French and German. The two languages have become of trade importance, to say nothing of any intellectual enjoyment they may afford. The time will be well spent that is devoted for three alternate mornings to the hard study of the first. Now our imaginary Assistant looks unwell, and delivers himself as follows:—"Yes, very good, if I had learnt at school, but they taught nothing there but Latin, of which I only recollect the first page of Cæsar's Commentaries. It would cost two or three guineas a quarter for a master, and I should be ruined in grammars, dictionaries, and books of reference; besides which you can never persuade me that I can learn French in one hour a day." No, very likely not, but you will soon convince yourself of that important fact. Perhaps you have seen the title of a pamphlet, "Plenty of Work and how to do it." The *modus operandi* is as follows;—Buy a Cobbett's Grammar. Read it through and through until its chapters are burnt into your mind, and when the excitement of a new impulse ceases, wade through its dreariest details with still untiring energy. London is a wide place, containing all sorts of people, nor is there any difficulty in meeting with Frenchmen as acquaintances. More could be learnt from them in casual intercourse than by any other means. From hence you cannot move a step without a teacher; no very alarming undertaking, as the slightest arrangement with two or three others similarly disposed would secure his services at a trifling cost, while to those living in the city, opportunities obtrude themselves unsought. Having gone thus far, Devotion would suffer little were you occasionally to attend the services of a foreign church.

The first year closes, during which a good insight into Elementary Chemistry has been gained, as well as a tolerable advance into the rudiments of French. Union is strength, and on this principle some book should occupy the second year

which contains the best combination of Chemistry, Pharmacy, and Materia Medica ; of which perhaps there is no better specimen than Pereira's *Elements*. If it be possible, borrow it ; if not, club together and buy it, for it must be had. The three alternate days still remain for disposal. For the second year it would be an useful variety to allot one hour a week to German, the other two being claimed by French as usual. One of the best Grammars is by Dr. Tiarks, price six shillings ; but Dictionaries, Manuals, and all sorts of foreign books may be picked up for a very little at a bookstall. Personal reserve is the only hindrance to companionship with some of the numerous resident Germans. Need it be mentioned that the best aid to study is at your own disposal. Buy any foreign work and its English version, then constantly translate and retranslate alternately from one to the other, correcting your attempts afterwards by the book in hand—for instance, *Les Confidences*, by Lamartine, or *Undine*, by De La Motte Fouqué. Children's books are not to be despised ; they are at first of greater service than Racine or Schiller.

The prospect brightens as the drudgery of elementary study is gradually left behind, and on the third year it would be no presumption to enter at once on those works in which the first principles of Pharmacy are carried out to their legitimate application, such as Watson's *Principles and Practice of Physic*, or Bowman's *Practical and Medical Chemistry*. Perhaps now is the best opportunity of understanding and tracing out the different preparations included in the various Pharmacopœias, for which the summary presented by Mr. Squire will be no small assistance. The two languages may also be studied together, but by this time they will have become an integral part of reading, not a separate branch. To gain this point will amply compensate for the hardships of the struggle, nor can we express a kinder wish for the student than the inheritance of such joy, recollecting that a contented mind is a continual feast. All this may be realized by one hour's application. Botany has been intentionally omitted, as it requires for its right study ample leisure and out-door speculations. To those gentlemen, who have time at their own disposal, who have free access to museums, libraries, and lectures, and are surrounded by all the appliances of learning, these remarks may seem absurd ; but

they are intended alone for those who have very scanty time and most limited opportunities. Weary, indeed, beyond description, is the manual occupation of ignorance. Can there be a harder fate than with an empty mind to associate with a row of monotonous bottles, a gas-jet, and unmeaning implements of coction? If you but knew the heaven you could create within you by this practice of habitual study! Knowledge turns the meanest circumstances into sources of enjoyment. Under such influence the solitary chamber brightens up, the charm of the Casino fades, and an inward satisfaction finds its expression in acts of good-will and courtesy in daily life.—*Pharm. Journ.* June 1854.

31, Southampton Street, Covent Garden, London.

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#### THE LEAVES OF THE MAGNOLIA TRIPETALA AS A DRESSING FOR BLISTERS.

By JOHN STAINBACK WILSON, M. D., of Airmount, Alabama.

As this Journal is eminently practical, it is hoped that a brief notice of the remarkable species of *Magnolia* which heads this article, will not be unacceptable.

The *M. tripetala* is known by the common names of "umbrella tree" and "wild cucumber," the latter being, we think, the most common in Alabama, where it grows abundantly; although it seems that this name is most generally applied to the *M. acuminata*.

The species of *Magnolia* under consideration, is one of the most remarkable productions of the United States, and will not fail to attract the attention of the most unobservant, by the wonderful size of its leaves and the beauty of its flowers: "the former are eighteen or twenty inches long, by seven or eight in breadth," and even larger than this: while the latter are of corresponding magnitude, being "seven or eight inches in diameter." We are informed that "this species of the *Magnolia* extends from the northern parts of New York to the southern limits of the United States," but we have never seen it in any part of the State of Georgia. Still, as it is no doubt a common production of the rich lime lands of the South Western and Western States, its "medical properties and uses" should be known to the physicians of that region; and it should not suffer unmerited neglect

like too many of our useful indigenous remedies. The *M. tripetala* (the bark) is highly esteemed by the common people as a tonic, and some of them even consider it an infallible specific in dropsies; this, of course, cannot be conceded, but the estimation in which it is held is, at least, an evidence that it is not by any means destitute of medicinal virtues. And in addition to this, we have the higher evidence of our Dispensatory that it has been found useful in chronic rheumatism, and intermittent and remittent fevers. We have had no experience with it in the treatment of the above diseases; but we have used the leaves as a dressing for blistered surfaces with satisfactory results, and the main object of this article is to commend this application to the attention of the profession.

We will simply, in conclusion, mention why we think this dressing should be considered worthy of notice: 1st. The leaves of the *Magnolia* are not officinal, and it may therefore, be presumed, that their uses are unknown. 2d. We think that they are equally as good as the collard or cabbage leaves, so much used; while they are often more readily obtainable, much larger, and less offensive in smell.

Before using, we scald them, but think it possible that they would answer every purpose, if applied in the natural state.  
*Southern Med. and Surg. Journal*, July, 1854.

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## PURIFICATION OF SPIRITS BY FILTRATION.

BY MR. W. SCHAEFFER.

Instead of resorting to repeated distillations for effecting the purification of spirits, Mr. Schaeffer proposes the use of a filter. In a suitable vessel, the form of which is not material, a filtering bed is constructed in the following manner:—On a false perforated bottom, covered with woollen or other fabric, a layer of about six inches of well-washed and very clean river sand is placed; next about twelve inches of granular charcoal, preferring that made from birch; on the charcoal is placed a layer of about one inch of wheat, boiled to such an extent as to cause it to swell as large as possible, and so that it will readily crush between the fingers. Above this is laid about ten inches of charcoal, then about one inch of broken oyster shells, and then about two inches

more of charcoal, over which is placed a layer of woollen or other fabric, and over it a perforated partition, on to which the spirit to be filtered is poured; the filter is kept covered, and in order that the spirit may flow freely into the compartment of the filter below the filtering materials, a tube connects such lower compartment with the upper compartment of the filter, so that the air may pass freely between the lower and upper compartments of the filter. On each of the several strata above described, it is desirable to place a layer of filtering paper.

The charcoal suitable for the above purpose is not such as is obtained in the ordinary mode of preparation. It is placed in a retort or oven, and heated to a red-heat until the blue flame has passed off, and the flame become red. The charcoal is then cooled in water, in which carbonate of potash has previously been dissolved, in the proportion of two ounces of carbonate to fifty gallons of water. The charcoal being deprived of the water is then reduced to a granular state, in which condition it is ready for use.—*Annals of Pharmacy*, August, 1854.

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#### NEW VARIETY OF BALSAM OF COPAIBA.

BY MR. CHARLES LOWE,

Assistant in the Royal Institution Laboratory, Manchester.

An organic fluid was lately placed in my hands by Mr. Grace Calvert for examination, which he had received from an oil merchant of this city, who stated that all he knew of the substance was, that it was obtained by the incision of a certain tree growing on the coast of *India*. From the characters it presents I have ascertained it to be a balsam of copaiba, but as it differs in some of its properties from other balsams that I have examined, I forward you the following notice, in hopes that it may prove interesting to some of your numerous readers.

In appearance this balsam of copaiba is dark colored and turbid. Its turbidity is due to a greenish resinous matter, held in suspension, which is, however, easily separable, either by filtration or deposition, leaving a brown transparent liquid of sp. gr. 0.970. When the latter fluid is submitted to a careful distillation it yields:—

Essential oil	.	.	65	per cent.
Resin	.	.	34	"
Acetic acid and water			1	"

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100

I find that the essential oil in its various reactions with potassium, iodine, nitric acid, &c., and moreover in taste, exactly corresponds with those presented by pure essence of copaiba. The resin left by distillation of the balsam, either with or without water, is, if deprived of the whole of the essential oil, extremely hard. Its entire solubility in coal naphtha proves the absence of any of the soft resin which exists in most of the copaiba of commerce. This hard resin (copaivic acid) being most probably the active principle of balsam of copaiba, I am induced to think its quantity and purity in the one I have examined is indicative of its superior value as a medicament. The dark color of the balsam may perhaps limit its employment, but the large quantity of copaivic acid it contains renders it valuable, as the latter may be made available by heating the filtered balsam to the boiling point with a small quantity of caustic potash or soda lye, of sp. gr. 1.34, and separating the resinate of potash or soda from the essential oil. The alkaline resinate may then be dissolved in water, giving a colorless solution (similar to Frank's specific), or the balsam may be treated with magnesia to form the ordinary copaiba pill.

I have in conclusion remarked:—

1st, That the essential oil obtained by the distillation of balsam copaiba has, like several other hydrocarbons, the property of dissolving indigo.

2dly, The new variety of balsam above described presents the curious property of becoming gelatinous (so much so that the tube may safely be inverted), if heated to 230° Fah., even if a *sealed* tube be employed. This character being dissimilar to the one given in the same circumstances with such other balsams as I had at my disposal, I am induced to attribute it to the large amount of "*hard resin*" it contains.

3dly, Balsams of copaiba in general give, on distillation with two per cent. sulphuric acid, a beautiful blue volatile oil. Chlorine, hypochlorite of lime, and bichromate of potash, give a si-

milar character with the balsam, which appears to me to be due to the oxidation of the hard resin, as I have been unable to obtain but a small proportion of the blue-colored oil when I employed a balsam containing "soft resin" comparatively to when I made use of the one above described, which, as I have already remarked, contains only "hard resin." A further support of this view is, that pure essence of copaiba assumes no blue coloration when distilled as above.

4thly, That cold sulphuric acid produces a purple coloration with balsam of copaiba, similar to that obtained by its action on cod-liver oil. Such being the case, it is probable that a small quantity of it, mixed with olive or some other oil, may be sold by unprincipled persons as genuine cod-liver oil.—*Pharm. Jour.* Aug. 1, 1854.

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#### TRADE IN CINCHONA BARK IN BOLIVIA.

BY DR. II. A. WEDDELL.

A source of wealth in the department of La Paz, quite as abundant as the mines, is the trade in Cinchona bark. The immense importance that the traffic in this production has acquired in Bolivia, is a sufficient reason why I should briefly claim the attention of my readers to the subject, especially as during my last residence at La Paz, Cinchona bark was the chief subject of all conversation, in consequence of the differences arising between the bark-cutters or *cascarilleros*, and the company which had obtained from the government the privilege of exporting this precious bark. It is on this point principally that I will make some remarks.

As has been stated by M. de Humboldt, it was not until about the year 1776 that the Cinchona barks of Lower Peru were offered in the markets of Europe. Up to that period these markets were supplied almost exclusively at the expense of the forests of Loxa: the barks from New Granada appeared about the same time; but it was not until much later that the Cinchona barks of Bolivia, or Higher Peru, entered into the competition—a competition which became formidable since by the discovery in 1820 of quinine, the febrifuge principle *par excellence* of the drug, it became manifest that the *Calisaya* bark far surpassed in richness all other species known. The forests of certain parts of Bolivia are in fact the



only spots where nature has produced in some abundance the tree which affords this superior bark; and in this respect the department of La Paz is particularly favored.

Shortly after the period I have mentioned, the influx of *casca-rilleros* into the forests became so considerable, that in a short time there hardly remained a Cinchona tree in the neighborhood of the inhabited districts, and the exports increased so much that the drug fell to a low price. The government of the day took, however, no steps to remedy such a state of things, and they consequently remained in the same position until about the year 1830. At that period the administration of General Santa Cruz, judging that it had become absolutely necessary to take some measures to prevent the exhaustion of so precious a source of wealth, formed the idea of prohibiting a free traffic in the bark, and of limiting to a certain amount the quantity which should thenceforth be collected in the forests and exported from the republic; but the means employed not having produced the expected result, it was decided that the exclusive right of exportation should be ceded to a national company. In November, 1834, the congress decreed a law on the subject, but it still proved ineffectual.

The free collection of the bark having then re-taken its destructive course, a new decree was requisite to suspend it. The cutting of Cinchona was consequently prohibited for five years, but long before the expiration of this term, the decree was repealed, and in its stead an export duty of from 12 to 20 *piastres* per quintal was levied.

In 1841, General Ballivian attained to power, but he introduced into the trade in barks no important change, until, in the year 1844, the legislative congress authorised the government itself to negotiate the capital necessary for the creation of a national bank which should purchase and export all the Cinchona bark produced in the country, paying for it at a rate to be fixed by itself (the bank), and which should bear a relation, said the law, to the funds which it (the bank) might have at its disposal, and to the interests of the *casca-rilleros*.

The capital, however, for this operation not having been forthcoming, the administration of Ballivian offered shortly afterwards to the highest bidder the exclusive privilege of exporting the Cin-

chona bark of the republic, limiting the contract to a duration of two years. No one, however, offered to accept it.

The year following (1845) the basis of the agreement offered by the government was modified, and the *monopoly* finally adjudicated to Messrs. Jorge Tesanos Pinto and Co., for the annual sum of 119,000 piastres, and for a period of five years, during which the annual export might not exceed four thousand quintals, or during the whole time, 20,000 quintals, or 2,000,000 pounds.

It appears that the congress of 1846, to which Ballivian submitted the plan adopted by his government, gave it its approbation, but the low price at which the company purchased the barks of those who, with immense toil had collected them in the depths of the forests, rendered it very unpopular, and it ceased not, from the time of its foundation, to excite public complaint, until at last a decree of General Belzu, dated 17th March, 1849, put an end to its existence. Happily for the company, its coffers had already been long since filled.

Unrestricted trade with a duty of twenty piastres per quintal was immediately re-established, until a new company could be formed upon the conditions laid down in the laws of 1834 and 1844, which indeed had been attempted, but with no greater success than on the first occasion. Recourse was then again had to the public, and the offers of Messrs. Aramayo, Brothers and Co., towards the end of the year 1849, were accepted.

The new society, whose operations commenced on the 1st of April, 1850, was to pay to the government the yearly sum of 142,000 piastres for the right of exporting annually 7000 quintals of barks, binding itself to purchase the said barks of any one offering them; the large bark or *Calisaya tabla* at the rate of 60 piastres per quintal, and the thin or rolled barks, known as *Charque* and *Canuto*, at the rate of 36 or 30 piastres per quintal of 100 Spanish pounds.

But the Pinto Company paid for the *Tabla* but from eighteen to twenty-two piastres, and for the *Canuto* from eight to ten piastres per quintal. One may judge then under what favorable auspices the new monopolists commenced operations; but the harmony was not to last long. The advantageous conditions which were offered to the *cascarilleros*, so different from those to which they had been accustomed, induced so great a number to engage

in collecting the bark, that before the termination of the first year there had arrived at La Paz more than 20,000 quintals; that is, twice as much as the Company had engaged and was prepared to purchase in the period, and as much as the Pinto Company would have exported in five years. Affairs then took another aspect. Upon the occurrence of this fresh crisis, which ought long previously to have been foreseen, the government at once concluded that it was its duty to sustain the monopoly, and consequently lent its support to the various measures suggested to it for this end. It enacted, in particular, that all barks obtained from the forests should be immediately deposited in the Company's warehouses, under guarantee of being purchased by it as soon as it required them. It then prohibited bark-cutting in all forests of the republic for four years.

The first of these decrees was intended to put a stop to contraband trade, which, though far less easy than one might have supposed, was, nevertheless, practicable. It exasperated particularly the inhabitants of La Paz.

The second decree, which attacked more especially the interests of the inhabitants of the towns of the interior, who still had a considerable number of workmen in the forests, was received by them with the same disfavor; and the complaints becoming general, the feeble President was driven to make, to the prejudice of the monopoly, several concessions which preluded its fall. In fact, the extraordinary congress, which assembled at La Paz during our abode there, having decided that the executive power had exceeded its functions in making with the firm of Aramayo the agreement in question, annulled the contract.

At this period the *Banco Aramayo* had purchased 14,000 quintals of barks, and had proposed to take 14,000 quintals in addition (making the lots of the *two* following years), one-third of the amount of which was to be paid in ready money, and the remainder by bills; but all the merchants were not willing to agree to this arrangement, and a new company, which offered to pay for the goods with ready money, having offered itself and having been accepted, the sales effected on credit by the old firm were immediately annulled. On my departure from La Paz the new Company had just been constituted under the title of Pedro Blaye and Co., and as it had engaged to purchase, on almost the same conditions

as the Aramayo Company, all the *Calisaya* barks then on sale, whether at La Paz or at Cochabamba, as well as those which might be collected in the forests before the termination of the year 1851, it was feared that the markets might become overstocked, and that the price of the precious drug might fall to such an extent that neither one nor other of the *bancos* would come out of the affair with profit.\*

In the two years which had then expired, the forests alone of Bolivia produced more than three millions of pounds of Cinchona bark! Such was the result of the sudden rise which took place in the price of barks, in consequence of the fall of the Pinto monopoly.

It was not, however, the poor *cascarilleros*, miserable laborers who, at the expense of vast toil, had dragged from the midst of the forests the much sought-for bark; it was not they, I say, who generally profited by the change, but far rather was it their wealthy employers. It is this that makes one the more regret the ravages committed in the forests of this region, and of which I will mention one instance.

I have said that the bark called *Quinquina tabla*, that is the larger bark of the trunk of the tree, was paid for at the rate of sixty piastres, and that the *Charque* or *Charquesillo*,† and the *canuto* or thinner barks obtained from the lower parts of the tree, realized scarcely the half of this sum. What was the result of this difference in price? It was, that in many places *all* the smaller bark, which was difficult to peel, had been abandoned, and nothing taken from the felled tree but the *large* bark. In the newly discovered Cinchona forests of Cochabamba I have been assured that in order not to have the trouble of felling a tree, they frequently were content to strip off the bark merely to the height that the hand could easily reach; and that if a tree was cut down, the *cas-*

\* The firm of Blaye and Co. has fallen in its turn, and I have learnt that the government has decided to conduct itself the export of the barks which remained in the warehouses, paying for them at the same rates that would have been given by the companies.

† *Charque* is the name applied in Spanish America to *dried meat*, which has generally the form of thin slices. It is to this that they compare the thin Cinchona barks which have dried without rolling up. The word *charquesillo* is a diminutive of *charque*.

*carilleros* would neglect to remove all the bark which lay next the earth, in order to avoid the trouble of turning the trunk.

Whatever may be said, the forests of Bolivia, rich as they are, cannot long resist continued attacks of the kind to which they have been recently subjected. Those who in Europe think they see enormous and ever-growing masses of *Cinchona*, may well imagine a perpetual abundance. But he who seeks in the localities where the *Cinchona* is produced, to ascertain how much of it exists, is compelled to form another opinion. The single fact will effectually show the constantly progressive diminution of the *Cinchona*,\* namely, that formerly it was everywhere to be met with in the neighborhoods of the inhabited places of the region, whereas now, to find a tree of some *decimètres* diameter, one must generally make a journey of several days into the recesses of the forests. But unless these forests be interminable, which they are not, or the trees that are felled be replaced by others, which unfortunately is very rarely the case, how can a traffic, conducted like that of which I have spoken, be carried on for an indefinite period? By all evidence it is plain that the *Calisaya* bark, if continued to be collected in this manner, will, sooner or later, more or less completely disappear from our markets (unless, however, the government attends to its reproduction), and the commoner species of *Cinchona* which will replace it; will, in their turn, doubtless share the same fate.

Before the misfortune which I foresee, arrive (and it will not be in our day), science will perhaps have made the conquest of some new remedy which will render the loss of Peruvian bark less to be regretted.

*Cinchona* bark is packed for exportation in fresh ox-hides, after having been previously sewed up in bags of coarse cloth, which, at La Paz, contain six *arrobas*, five pounds. The bale or seron complete, weighing about six *arrobas*, fifteen pounds, forms half a mule load. The entire load, therefore, a little exceeds thirteen *arrobas*, the transport of which to the coast costs, on an average, ten piastres.—*Pharmaceutical Journal*, Sept., 1854, from *Voyage dans le Nord de la Bolivie*. Paris, 1853. Chap. xiii.

\* I speak here of *Cinchona Calisaya* only, for several other species are still very common.

## OBSERVATIONS ON THE COLORING MATTERS OF FLOWERS.

BY E. FILHOL.

*White Flowers.*—If flowers of *Viburnum opulus*, *Philadelphus coronaria*, *Chrysanthemum vulgare*, white roses, and a number of other flowers, be exposed for a few moments to the action of ammonia, they acquire a yellow tinge of greater or less intensity, which remains for a considerable time. Flowers of *Viburnum opulus* by this treatment acquire a yellow color as fine as that of *Cytisus laburnum*. The matter which thus becomes yellow under the influence of alkalis appears to be present in all white flowers; some flowers contain only a small quantity of it, but these are rare.

In variegated flowers of which the corolla is partially white, these portions usually acquire a fine yellow tint under the influence of ammonia. The stamina, the pistils, and in general all the white parts of flowers, act in the same manner. The leaves themselves become yellow when they are accidentally deprived of chlorophylle. I ascertained this fact with a plant of *Convallaria polygonatum*, of which the leaves presented alternate green and white bands. The latter became bright yellow from the action of ammonia, exactly like flowers. The tissue of some fruits also becomes yellow, although less distinctly, under the influence of alkalis.

The most convenient mode of converting a white flower into a yellow one is to introduce it into a wide-mouthed flask containing a little liquid ammonia, and to expose it to the action of the alkaline vapor. The change then takes place very rapidly. When the greatest part of the flower has become yellow, it may be taken out of the flask and exposed to the air, when the parts which still remained white will gradually charge until the flower acquires a uniform tint. The flower may also be dipped into water, alcohol or ether, mixed with a little ammonia. The latter fluids should be preferred when the flower is covered with a fatty coating, which would prevent their being moistened by a watery fluid. If a white flower that has been rendered yellow be dipped into acidulated water, it gradually recovers its white color.

These experiments remind one that when dyers wish to employ the color of woad in dyeing, they add a little carbonate of soda to

their vat, which gives considerable brightness to the tint. It is easy to prove also that acids, even when very weak, cause the disappearance of the greater part of the color of a decoction of woad. From this it seems not improbable that the substance which communicates to white flowers the property of becoming yellow when in contact with alkalies may be *luteoline*.

If the petals of white roses be boiled with distilled water, and a little carbonate of soda and sulphate of copper be added to the decoction, as is done with the decoction of woad, a liquid is obtained possessing a bright golden-yellow color, which may be employed in dyeing yellow. This liquid will give a fine yellow tint to linen and cotton fabrics, and nearly all white flowers will furnish similar results. I have dyed pieces of linen and cotton with decoctions of white roses, of the flowers of *Spiraea filipendula*, *Philadelphus coronaria* and *Galium mollugo*.

The matter to which white flowers are indebted for this property of acquiring a yellow color under the influence of alkalies, dissolves readily in water, still more so in alcohol, but less in ether. When the superficial layer of the petals of flowers which have been colored yellow by ammonia is removed, all the cells are seen to be filled with a yellow fluid, in which no granules are to be perceived.

*Dark Red Flowers.*—With boiling water or alcohol, the flowers of the wild poppy furnish a violet-red solution. This acquires a fine scarlet color by the action of acids, even when very weak. If ammonia be poured into the liquid thus acidulated, it becomes of a fine violet color, without the least mixture of green. But if, instead of adding ammonia to the acidulated liquid, it is added directly to the infusion, this acquires a dirty greenish-red tint. When the flowers themselves are exposed to the action of ammonia, they acquire a fine violet color, like that obtained with the acidulated fluid. The coloring matter of the poppy, therefore, differs greatly from the cyanine of MM. Fremy and Cloez, for alkalies do not give it a green color.

The flowers of *Pelargonium zonale* also become of a fine violet color under the influence of ammonia; their coloring matter behaves like that of the poppy. The dark red garden verbena gives a violet-red tint to alcohol. The alcoholic solution, treated with ammonia, acquires a vinous color with a slight greenish tint. If



the alcoholic infusion of these flowers be digested with a little dry powdered hydrate of alumina, the latter acquires a light yellow color, and the supernatant fluid becomes of a fine red color under the influence of acids, and of a blue without the least mixture of green by the action of bases. The verbenæ consequently contains two distinct matters, of which one becomes blue under the influence of bases, whilst the other becomes yellow; it is to the mixture of these two matters that the green color of the alcoholic tincture of these flowers is due.

The petals of *Anemone hortensis* act like those of the verbenæ. The flowers of the red pæony become of a pure blue color under the influence of ammonia. These flowers are rapidly deprived of color by alcohol; the tincture which they furnish is but slightly colored, but it becomes of a deep and bright red by the addition of the smallest trace of acid. The acidulated liquid becomes blue with ammonia, whilst the non-acidulated alcoholic solution acquires a greenish tint. The petals of dark red roses become blue when exposed to ammoniacal vapors, but the color soon passes to a greenish-blue. Alcohol readily dissolves the coloring matter of roses, but acquires very little color. The slightest addition of acid communicates a deep red color to the alcoholic solution; ammonia poured into the acidulated liquid changes it to a greenish blue.

*Rose-colored Flowers.*—These flowers contain a mixture of two juices, of which one is colorless in acid liquids, whilst the other is red. The former becomes yellow when mixed with alkalis, the second becomes blue, and the mixture of these latter colors produces a green tint. Hence the tints which will be acquired by red or rose-colored flowers, when exposed to the action of ammoniacal vapors, may be easily indicated beforehand. It is clear that the green color will approach yellow more and more in proportion to the paleness of the rose, and that it will have a blue tendency in proportion as the color becomes deeper.

*Blue Flowers.*—The preceding statements regarding red and rose-colored flowers, applies also to blue flowers. The green color produced in blue flowers by the action of watery ammonia, tends more and more to yellow in proportion to the paleness of the flower.

*Effects of the Mixture of the White and Colored Juices of Flowers.*—When flowers of iris, of violets, of pæonies, of *Cercis siliquastrum*, &c., are infused in alcohol, one is struck with the weakness of tint of the alcoholic solution, even when the petals are completely deprived of color. It appears natural, at first sight, to attribute this decoloration to the influence of the alcohol, which may act as a reducing agent; but a close examination of the facts does not permit us to rest satisfied with this explanation; and without denying that alcohol may exercise the influence attributed to it by MM. Fremy and Cloez, I think that the following theory, either alone or combined with that just referred to, may readily account for the circumstances in question. In fact, if, instead of treating the above-mentioned flowers with alcohol, they are infused in boiling water, the watery solution is not more deeply colored than the alcoholic tincture. It would be necessary, therefore, to admit that water itself is a reducing agent, which is by no means probable.

If into these solutions, whether watery or alcoholic, the smallest quantity of a soluble acid be poured, they instantly acquire a bright red color, far deeper in tint than the original liquid. The kind of acid is quite immaterial, for even sulphurous acid immediately brightens the shade, and reproduces the color which was only concealed. The prolonged action of this acid, however, soon destroys the color. Can it be imagined that the coloring matter would reappear immediately upon the addition of *any* acid, if it had been reduced? And especially on this hypothesis, can we account for the action of sulphurous acid? I think not.

In my opinion, the decoloration is due to the mixture of the juice contained in the colorless cells with that of the colored cells. When alcohol or boiling water acts upon a flower, its organization is destroyed, the juices contained in its cells becomes mixed, and the coloring matter disappears. The following experiment lends support to this explanation.

If two equal volumes of a slightly acidulated infusion, either watery or alcoholic, of pæony flowers, be diluted, the one with four times its volume of water, the other with four times its volume of an infusion of white flowers, it will be seen that the latter will retain much less color than the former.

The white juices consequently destroy, or rather dissemble the

coloring matter. The question now arises, whether these juices act as reducing bodies, or whether they simply form colorless combinations. The experiments to which I have referred above may, I think, serve to answer this question ; for if reduction takes place, sulphurous acid would not reproduce the color. I consider therefore, that the coloring matter does not experience any reduction, and that it forms with the elements of the colorless juices a colorless combination. In infusions prepared by the action of alcohol or water upon flowers, one portion of the coloring matter remains free, whilst the other enters into the combination just mentioned. It is easy to separate the colored portion from the colorless, by triturating the liquid with a little artificial phosphate of lime or dry hydrate of alumina ; the colored part is the first to fix upon the solid body, whilst that of which the color is dissembled remains for the most part dissolved. If the liquid be filtered, it passes without color. It may then be colored red by acid, and green or blue by an alkaline solution.—*Chem. Gaz.*, Sept. 1, 1854, from *Comptes Rendus*, July 24, 1854, p. 194.

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#### PROCESS FOR HELIOGRAPHIC ENGRAVING.

M. Balduş takes simply a plate of copper, and spreads upon it a sensitive coating of *bitumen of Judea*. Upon this plate, thus covered, he lays a photograph on paper of the object to be engraved. This photograph is positive, and must therefore impress a negative on the metal by the action of the light. After about a quarter of an hour's exposure to the sun, the image is produced upon the resinous coating, but is not visible, and it is made to appear by washing the plate with a solvent, which removes the parts not affected by the light, and allows the picture to be seen represented by the resinous lines of the bitumen. The design, however, is formed by a veil so delicate and thin, that it would soon partly disappear if the plate remained in the liquid. To give it the proper firmness and resistance, it is exposed for two days to the action of diffused light ; the picture being thus strengthened by its exposure to daylight, the plate is plunged into a galvano-plastic bath of sulphate of copper. If, then, you attach the plate to the negative pole of the battery, you deposit, on the unprotected parts of the metal, a coating of copper in relief ; but if you attach it to

the positive pole, you eat away the metal at these points, and thus form an engraving, so that you can, at will, according to the battery pole which you use, obtain either an engraving analogous to an ordinary copper-plate, which can be printed by the same process, or an engraving in relief, to be printed like a wood-cut, with printing ink.

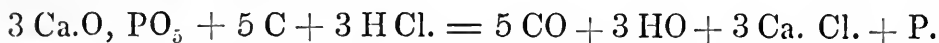
When it is desired to reproduce an ordinary engraving, clearly executed upon paper, as in the case assumed above, the photograph requires no peculiar preparation previous to its transfer to the metal. But this is not generally the object of photographic engraving; it is to reproduce natural objects without any intermediate process. When, then, it is required to reproduce, for instance, objects of natural history, landscapes, or monuments, the photograph used must be got in a way somewhat different from the common mode. It is in fact, the production of that which engravers call the grain, that is, the lights, put by the graver in the shadows of the picture, which constitutes the essential difficulty in engraving photographs. The photograph has nothing of the kind, for the shadows are made of a uniform tint; we require, therefore, a peculiar artifice to produce this grain, which does not exist in the photograph. In the works of MM. Rousseau, Devéria, and Riffaut, they are produced afterwards on the plate by the graver. In the new process, proposed by M. Baldus, this grain, so necessary for the engraving, is formed on the photograph itself, and the use of the graver thus rendered superfluous. This grain is formed on the negative photograph, by adding to the sensitive substances a compound, which, crystallizing in the paper, forms small transparent grains. The complete publication of all the details of this new process, which the author will doubtless make, will allow the curious chemical effect which takes place under these circumstances, to be understood.

There remains but a single word to be added: the proofs on paper obtained by these new plates of photographic origin are so perfect, that the great problem of engraving by the agency of light may be regarded as definitely solved. Not only this new process is going to reduce very much the price of engravings, but there is no artist or amateur of photography, who may not soon have the pleasure of reproducing, in a corner of his room, all the photographs which he obtains.—*Journal of the Franklin Institute from Cosmos*, 26th May, 1854.

## NEW PROCESS FOR PROCURING PHOSPHORUS.

By M. CARI-MONTRAND.

M. Dumas read to the Academy of Sciences, at Paris, at their Session of 15th May, a letter from a young chemist, M. Cari-Montrand, in which he proposes a new mode for the preparation of phosphorus on a practical scale, the usual process being slow, complicated, yielding but little product, and giving an educt of no value. The process proposed consists of passing over a thorough mixture of equal parts of finely-powdered charcoal and bone-earth, at a red heat, a quantity of dry hydro-chloric acid, or still better, of dry chlorine. The end of the porcelain tube in which the experiment was performed, was attached to a glass tube dipped under water. Phosphorus, carbonic oxide, and water, are given off, and chloride of calcium is left in the tube. On analysis, no trace of phosphoric acid, or any other compound, was found in the tube; the decomposition is therefore complete, and as no phosphorus passed off, the whole amount contained in the earth was obtained as a product. The following equation explains the reaction, when hydro-chloric acid is used :



The same letter contains a notice interesting to chemists, of the entire decomposition of gypsum, and the procuring of its sulphuric acid, by treatment of a mixture with charcoal by dry chlorine, or hydro-chloric acid gas. A good deal of excitement appears to have been caused among some of the would-be scientific papers, by the announcement of this process, which, it was asserted, would materially reduce the price of sulphuric acid. But it will be easily seen that, at least the equivalent of hydro-chloric acid (dry weight 36), must be used for each equivalent of oil of vitriol, (weight 49,) the process would be more expensive than at present. This is clearly stated by M. Cari-Montrand, who had the process tried on a large scale by M. Kühlmann, but found that the expense of making and drying the hydro-chloric acid, was an insurmountable obstacle to its introduction into the arts.—*Journal of the Franklin Institute, Sept., 1854.*

## MEDICINAL CONSTITUENTS OF THE LEMON.

Dr. Cogswell read before the Physiological Society, (March 13, 1854), a paper on this subject. The author's attention had been drawn to the subject by the publications of Dr. Owen Rees, and others, on the treatment of rheumatism by lemon-juice. The remedy was no doubt often successful, but still there were many failures, and these did not seem to be sufficiently accounted for, as had been attempted, by reference to the different forms of the disease. But there was much uncertainty as to what constitutes lemonjuice. Has it always the same composition, or are there not various accidental circumstances attending its preparation, calculated to render one specimen different from another. Sometimes the fruit is ordered to be squeezed at home; at other times, the prescription is sent to a druggist, or the juice is allowed to be purchased where it is cheapest. When obtained from the fresh fruit, by depression, without removing the rind, it is a turbid, pale yellow fluid, exhaling a grateful odor of the essential oil, and of a specific gravity in different specimens between 1043 and 1047. By distilling a fresh specimen which had not been filtered, the author had obtained half a drachm of essential oil from 12 ounces; but from another, after filtering, only five minims. Some, purchased at a fruit-preserver's, which had stood for several months in a cask, and undergone a kind of fermentation, was bright yellow and clear, of density 1037, and yielded scarcely a trace of oil. It had received an impregnation of common salt from the former contents of the cask. A sample of lime-juice, procured from the stores of a merchant-vessel, smelt of rum, had a density of 1010, and contained a multitude of torulæ. The effect of the different processes for preserving the juice, mentioned by Christison, was to separate one or more of the ingredients which might be of consequence to its remedial efficacy. Heat would expel the essential oil, filtration remove the solid debris of the pulp, and the addition of alcohol with filtration withdraw the mucilaginous matter. It appeared that the druggists in London do not make a practice of keeping the juice ready on demand, but that they generally prepare it extemporaneously when ordered. The dose was equally a matter of uncertainty; for although it seemed to be the prevalent idea that the average produce of a lemon was

about half an ounce, the author had not found any ordinary specimen yield less than seven drachms, while the average was rather more than an ounce. Hence, he concluded that it was necessary to fix a standard for the composition and dose of the juice, before its remedial efficacy could be fairly tested. In the rind, besides the essential oil, the author observed granules of starch. A decoction of the white spongy portion afforded pectine, hesperidine, and a trace of tannin. Hesperidine was discovered by M. Lebreton, who employed orangettes; but his process was complicated and unproductive. The author had found it was deposited in crystals by evaporating a decoction of the white portion of the rind, while in the same portion of the shaddock, it was separated by simple maceration in cold water, and could be collected in a filter. A specimen as thus obtained, was exhibited to the Society. It had a decidedly bitter taste, but turned, not red, as commonly stated, but yellow with sulphuric acid.

Another principle, called *aurantiin*, was supposed to be the source of the bitterness of the lemon tribe; but its existence had not been demonstrated, and the author was disposed to regard the hesperidine as the true bitter principle. The essential oil belonged to a class corresponding to the formula  $C_5H_4$ , and including the other oils of the fruits of the lemon tribe, the oils of turpentine, juniper, savine, elemi, copaiba, cubebs, and pepper. Some of these were approved remedies in rheumatism. From trials made with the oil of lemon in this disease, in flatulent dyspepsia, and leucorrhœa, the author entertained a high opinion of its therapeutical value, and thought that the chemical fact stated, suggested the possibility of bringing together the various scattered evidences on the medicinal effects of the oils of the same class, and referring them to a general law. The fresh juice, when evaporated in a water bath, yielded about 8.5 grains per cent. of solid extract, and the ash obtained by incineration amounted to 0.27 per cent. The latter contained sulphuric and phosphoric acids, potash, lime, magnesia and iron. A controversy existed as to whether the citric acid or the potash, in lemon-juice, was the true medicinal constituent. In reviewing the evidence, the author conceived that it was an error to suppose that either of them would answer so well separately. The efficiency of the juice probably depended, not on one or the other of the ingredients, but on the whole combined. In



using the essential oil, he gave it in doses of about fifteen minims, with two drachms of vinegar in decoction of barley, always being careful to keep the bowels freely open by purgatives. If the efficacy of lemon-juice in acute rheumatism depended on anything more than the refrigerant action of the citric acid, he thought the true anti-arthritic agent was the essential oil when present, and repeated his views as to the necessity of establishing a standard for the composition of the juice. A table was exhibited, showing the correspondence in composition of the non-oxygenated essential oils mentioned in the paper.—*Hays' Journal, from Med. Times and Gaz., April 1, 1854.*

## Varieties.

*On Perfumery.* BY SEPTIMUS PIESSE.

Continued from page 470.

### ROSEMARY.—

“There’s rosemary, that’s for remembrance.”—SHAKESPEARE.

By distilling the *Rosmarinus officinalis* a thin limpid essential oil is procured, having the characteristic odor of the plant, which is more aromatic than sweet. One cwt. of the fresh herb yields about twenty-four ounces of oil. Essential oil of rosemary is very extensively used in perfumery, especially in combination with other essential oils, for scenting soap. Eau de Cologne cannot be made without it, and in the once famous “Hungary water,” it is the leading ingredient. The following is the composition of

#### HUNGARY WATER.

Rectified alcohol	. . . . .	1 gallon.
Oil of English rosemary	. . . . .	2 oz.
“ lemon peel	. . . . .	1 oz.
“ balm ( <i>melissa</i> )	. . . . .	1 oz.
“ mint	. . . . .	$\frac{1}{2}$ drachm.
Esprit de rose	. . . . .	1 pint.
Extract of fleur d’orange	. . . . .	1 pint.

It is put up for sale in a similar way to eau de Cologne, and is said to take its name from one of the queens of Hungary, who is reported to have derived great benefit from a bath containing it, at the age of seventy-five years. There is no doubt that clergymen and orators, while speaking for any time, would derive great benefit from perfuming their handkerchiefs

with Hungary water or eau de Cologne, as the rosemary they contain excites the mind to a vigorous action, sufficient of the stimulant being inhaled by occasionally wiping the face with the handkerchief containing these "waters." Shakespeare giving us the key, we can understand how it is that such perfumes containing rosemary are universally said to be "so refreshing."

**RHODIUM.**—When the rose wood, the lignum of the *Convolvulus scoparius*, is distilled, a sweet-smelling oil is procured, resembling in some slight degree the fragrance of the rose, and hence its name. At one time, that is, prior to the cultivation of the rose-leaf geranium, the distillates from rose wood and from the root of the *Genista canariensis* (canary rose wood), were principally drawn for the adulteration of real otto of roses, but as the geranium oil answers so much better, the oil of rhodium has fallen into disuse, hence its comparative scarcity in the market at the present day, though our grandfathers knew it well. One cwt. of wood yields about three ounces of oil.

Ground rose wood is valuable as a basis in the manufacture of sachet powders for perfuming the wardrobe.

The French have given the name jacaranda, to rosewood, under the idea that the plant called jacaranda by the Brazilians yields it, which is not the case; the same word has perhaps been the origin of palisander—palixander, badly written.

**SAGE.**—A powerful scenting oil can be procured by distillation from any of the *Salvies*. It is rarely used, but is nevertheless very valuable in combination for scenting soap.

Dried sage leaves, ground, will compound well for sachets.

**SANTAL.**—*Santalum album*.

"The santal tree perfumes, when riven,  
The axe that laid it low."—CAMERON.

This is an old favorite with the lovers of scent: it is the wood that possesses the odor. The finest santal wood grows in the island of Timor, and the Santal Wood Islands, where it is extensively cultivated for the Chinese market. In the religious ceremonies of the Brahmins, Hindoos, and Chinese, santal wood is burned by way of incense to an extent almost beyond belief. The *Santala* grew plentifully in China, but the continued offerings to the Buddahs have almost exterminated the plant from the Celestial Empire; and such is the demand, that it is about to be cultivated in Western Australia, in the expectation of a profitable return, which, we doubt not, will be realized; England alone would consume tenfold the quantity she now does, were its price within the range of other perfuming substances.—The essential oil which exists in the santal wood, is readily procured by distillation; one cwt. of good wood will yield about thirty ounces of oil.

The white ant, which is so common in India and China, eating into every organic matter that it comes across, appears to have no relish for santal

wood, hence it is frequently made into caskets, jewel-boxes, deed-cases, &c. This quality, as well as its fragrance, renders it a valuable article to the cabinet-makers of the East.

The essential oil of santal is remarkably dense, and is, above all others, oleaginous in its appearance, and, when good, is of a dark straw color. When dissolved in spirit, it enters into the composition of a great many of the old-fashioned bouquets, such as "Mareehale," and others, the formula of which will be given hereafter. Perfumers thus make what is called

#### EXTRAIT DE BOIS DE SANTAL.

Rectified Spirits	. . . . .	7 pints.
Esprit de rose	. . . . .	1 pint.
Essential oil of santal	. . . . .	3 oz.

All those *Extracts* made by dissolving essential oil in alcohol, are nearly *white*, or at least only slightly tinted by the color of the oil used. When a perfumer has to impart a delicate *odeur* to a lady's *mouchoir*, which in some instances cost "no end of money," and is an object, at any cost, to retain unsullied, it behoves his reputation to sell an article that will not stain a delicate white fabric. Now, when a perfume is made in a direct manner from any wood or herb, as tinctures are made, that is, by infusion in alcohol, there is obtained, besides the odoriferous substance, a solution of coloring and extractive matter, which is exceedingly detrimental to its fragrance, besides seriously staining any cambric handkerchief that it may be used upon; and for this reason this latter method should never be adopted, except for use upon silk handkerchiefs.

The odor of santal assimilates well with rose; hence, prior to the cultivation of rose-leaf geranium, it was used to adulterate otto of roses; but is now but seldom used for that purpose.

By a "phonetic" error, santal is often printed "sandal," and "sandel."

**SASSAFRAS.**—Some of the perfumers of Germany use a tincture of the wood of the *Laurus sassafras* in the manufacture of hair-washes and other nostrums: but as, in our opinion, it has rather a "physicky" smell than flowery, we cannot recommend the German recipes. The *Eau Athenienne*, notwithstanding, has some reputation as a hair water, but is little else than a weak tincture or sassafras.

**SPIKE.**—French oil of lavender, which is procured from the *Lavendula spica*, is generally called oil of spike. [See *Lavendula*.]

**STORAX and TOLU** are used in perfumery in the same way as benzoin, namely, by solution in spirit as a tincture. An ounce of tincture of storax tolu, or benzoin, being added to a pound of any very volatile perfume, gives a degree of permanence to it, and makes it last longer on the handkerchief than it otherwise would: thus, when any perfume is made by the solution of an essential oil in spirit, it is usual to add to it a small portion of a substance which is less volatile, such as extract of musk, extract of vanilla,

ambergis, storax, tolu, orris, vitivert, or benzoin ; the manufacturer using his judgment and discretion as to which of these materials are to be employed, choosing, of course, those which are most compatible with the odor he is making.

The power which these bodies have of "fixing" a volatile substance, renders them valuable to the perfumer, independent of their aroma, which is due in many cases to benzoic acid, slightly modified by an essential oil peculiar to each substance, and which is taken up by the alcohol, together with a portion of resin. When the perfume is put upon a handkerchief, the most volatile substances disappear first ; thus, after the alcohol has evaporated, the odors of the essential oil appear stronger ; if it contains any resinous body, the essential oils are held in solution, as it were, by the resin, and thus retained on the fabric. Supposing a perfume to be made of essential oils only, without any "fixing" substance, the perfume "dies away," the olfactory nerve, if tutored, will detect its composition, for it spontaneously analyses itself, no two essential oils having the same volatility ; thus, make a mixture of rose, jessamine, and patchouly ; the jessamine predominates first, then the rose, and, lastly, the patchouly, which will be found hours after the others have disappeared.

TUBEROSE.—One of the most exquisite odors with which we are acquainted, is obtained by *enfleurage* from the tuberose flower. It is, as it were, a nosegay in itself, and reminds one of the perfume observed in a well-stocked flower garden at even close, consequently it is much in demand by perfumers for compounding sweet essences.

#### EXTRACT OF TUBEROSE.

Six pounds of No. 24 tuberose pomatum cut up very fine, is to be placed into 1 gallon of the best rectified spirit. After standing for three weeks or a month at summer heat, and with frequent agitation, it is fit to draw off, and being strained through cotton wool, is ready for either sale or use in the manufacture of bouquets.

This essence of tuberose, like that of jessamine, is exceedingly volatile, and if sold in its pure state quickly "flies off" the handkerchief ; it is therefore necessary to add some fixing ingredient, and for this purpose it is best to use one ounce of extract of orris, or half an ounce of extract of vanilla, to every pint of tuberose.

THYME.—All the different species of thyme, but more particularly the lemon thyme, the *Thymus serpyllum*, as well as the marjorans, origanum, &c., yield, by distillation, fragrant essential oils, that are extensively used by manufacturing perfumers for scenting soaps ; though well adapted for this purpose, they do not answer at all in any other combinations. Both in grease and in spirit all these oils impart a herby smell (very naturally) rather than a flowery one, and as a consequence, are not considered *recherché*.

When any of these herbs are dried and ground, they usefully enter into the composition of sachet powders.

TONQUIN, or TONKA.—The seeds of the *Dipterex odorata* are the tonquin or *coumarouma* beans of commerce. When fresh they are exceedingly fragrant, having an intense odor of newly-made hay. The *Anthoxanthum odoratum*, or sweet-smelling vernal grass, to which new hay owes its odor, probably yields identically the same fragrant principle, and it is remarkable that both tonquin beans and vernal grass, while actually growing, are nearly scentless, but become rapidly aromatic when severed from the parent stock.

Chemically considered, tonquin beans are very interesting, containing, when fresh, a fragrant volatile oil, (to which their odor is principally due), benzoic acid, a fat oil and a neutral principle—*Coumarin*. In perfumery they are valuable, as, when ground, they form with other bodies an excellent and permanent sachet, and, by infusion in spirit, the tincture or extract of tonquin enters into a thousand of the compound essences, but, on account of its great strength, it must be used with caution, otherwise, people say, your perfume is “snuffy,” owing to the predominance of the odor and its well-known use in the boxes of those who indulge in the titillating dust.

#### EXTRACT OF TONQUIN.

Tonquin beans	. . . . .	2 lbs.
Rectified spirit	. . . . .	1 gallon.

Digest for a month at summer heat. Even after this maceration they are still useful, when dried and ground, in those compounds known as *POT POURRI*, *OLLA PODRIDA*, &c. The extract of tonquin, like extract of orris and extract of vanilla, is never sold pure, but is only used in the manufactory of compound perfumes. It is the leading ingredient in *Bouquet du Champ*, the field bouquet, the great resemblance of which to the odor of the hay-field, renders it a favorite to the lovers of the pastoral.

VANILLA, also called BANILLOES.—The pod or bean of the *Vanilla plantifolia* yields a perfume of rare excellence when good; and if kept for some time, it becomes covered with an efflorescence of needle crystals, possessing properties similar to benzoic acid, but differing from it in composition. Few objects are more beautiful to look upon than this, when viewed by the microscope with the aid of polarized light.

#### EXTRACT OF VANILLA.

Vanilla pods	. . . . .	½ lb.
Rectified spirit	. . . . .	1 gallon.

Slit the pods from end to end, so as to lay open the interior, then cut them up in lengths of about a quarter of an inch, macerate with occasional agitation, for about a month, the tincture thus formed will only require straining through cotton to be ready for any use that may be required. In this

state it is rarely sold for a perfume, but is consumed in the manufacture of compound odors, bouquets, or nosegays, as they are called.

Extract of vanilla is also used largely in the manufacture of hair-washes, which are readily made by mixing the extract of vanilla with either rose, orange, elder, or rosemary water, and afterwards filtering.

We need scarcely mention that vanilla is greatly used by cooks and confectioners for flavoring.

VERBENA, or VERVAINE.—The scented species of this plant, the lemon verbena, *Aloysia citri odora* (Hooker), gives one of the finest perfumes with which we are acquainted; it is well known as yielding a delightful fragrance by merely drawing the hand over the plant; some of the little vessels or sacks containing the essential oil must be crushed in this act, as there is little or no odor by merely smelling at the plant.

The essential oil, which can be extracted from the leaves by distillation with water, on account of its high price, is rarely, if ever, used by the manufacturing perfumer, but it is most successfully imitated by mixing the oil of lemon grass, *Andropogon schoenanthus*, with rectified spirit, the odor of which resembles the former to a nicety. The following are good forms for making the

## EXTRACT OF VERBENA.

Rectified spirit	. . . . .	1 pint.
Oil of lemon grass	. . . . .	3 drachms.
“ lemon peel	. . . . .	2 oz.
“ orange peel	. . . . .	½ oz.

After standing together for a few hours, and then filtering, it is fit for sale.

Another mixture of this kind, presumed by the public to be made from the same plant, but of a finer quality, is composed thus—it is sold under the title of

## EXTRAIT DE VERVEINE.

Rectified spirit	. . . . .	1 pint.
Oil of orange peel	. . . . .	1 oz.
“ lemon peel	. . . . .	2 oz.
“ citron	. . . . .	1 dram.
“ lemon grass	. . . . .	2½ drams.
Extrait de fleur d'orange	. . . . .	7 oz.
“ tubereuse	. . . . .	7 oz.
Esprit de rose	. . . . .	½ pint.

This mixture is exceedingly refreshing, and is one of the most elegant perfumes that is made. Being white it does not stain the handkerchief. It is best when sold fresh made, as by age the citrine oils oxidize, and the perfume acquires an ethereal odor, and then customers say “it is sour.” The vervaine thus prepared, enters into a great many of the bouquets, that are sold under the title of the “Court Bouquet,” and others which are mix-

tures of violet, rose, and jessamine, with verbena or vervaine in different proportions. In these preparations, as also in Eau de Portugal, and in fact where any of the citrine oils are used, a much finer product is obtained by using grape spirit or brandy, in preference to the English corn spirit, as a solvent for them. Nor do they deteriorate so quickly in French spirit as in English. Whether this be due to the oil in the wine (œanthic ether) or not we cannot say, but think it is so.

VITIVERT, or Kus-Rus, is the rhizome of an Indian grass. In the neighborhood of Calcutta, and in the city, this material has an extensive use by being manufactured into awnings, blinds, and sunshades. During the hot seasons an attendant sprinkles water over them; this operation cools the apartment by the evaporation of the water, and, at the same time, perfumes the atmosphere, in a very agreeable manner, with the odoriferous principle of the vitivert. It has a smell between the aromatic or spicy odor and that of flowers—if such a distinction can be admitted. We classify it with orris root, not that it has any odor resembling it, but because it has a like effect in use in perfumery, and because it is prepared as a tincture for obtaining its odor.

About four pounds of the dried vitivert, as it is imported, being cut small and set to steep in a gallon of rectified spirits for a fortnight, produces the

ESSENCE OF VITIVERT of the shops. In this state it is rarely used as a perfume, although it is occasionally asked for by those who, perhaps, have learnt to admire its odor by their previous residence in “the eastern clime.” The extract essence, or tincture of vitivert, enters into the composition of several of the much-admired and old boquets manufactured in the early days of perfumery in England, such as “*Mousseline des Indes*,” for which preparation, M. Delcroix, in the zenith of his fame, created quite a *furor* in the fashionable world.

MARACHELE and BOQUET DU ROI, perfumes which have also “had their day,” owe much of their peculiarity to the vitivert contained in them.

Bundles of vitivert are sold for perfuming linen and preventing moth, and when ground, is used to manufacture certain sachet powders.

#### VIOLET.—

“The forward violet thus did I chide :

Sweet thief, whence didst thou steal thy sweet that smells,  
If not from my love's breath ?”

The perfume exhaled by the *Viola odorata* is so universally admired, that to speak in its favor would be more than superfluous. The demand for the “essence of violets” is far greater than the manufacturing perfumers are at present able to supply, and, as a consequence, it is difficult to procure the genuine article through the ordinary sources of trade.

Real violet is, however, sold by many of the retail perfumers of the West End of London, but at a price that prohibits its use except by the affluent or extravagant votaries of fashion. The true smelling principle or essential oil of violets has never yet been isolated: a very concentrated solution



in alcohol impresses the olfactory nerve with the idea of the presence of hydrocyanic acid, which is probably a true impression. Burnett says that the plant *Viola tricolor* (heart's ease,) when bruised, smells like peach kernels, and doubtless, therefore, contains prussic acid.

The flowers of the heart's ease are scentless, but the plant evidently contains a principle which, in other species of the viola, is eliminated as the "sweet that smells" so beautifully alluded to by Shakspeare.

For commercial purposes, the odor of the violet is procured in combination with spirit, oil, or suet, precisely according to the methods previously described for obtaining the aroma of some other flowers before mentioned, such as those for cassie, jessamine, orange flower, namely, by maceration, or by *enfleurage*, the former method being principally adopted, followed by when "essence" is required, digesting the pomade in rectified alcohol.

Good essence of violet, thus made, is of a beautiful green color, and, though of a rich deep tint, has no power to stain a white fabric, and its odor is perfectly natural.

The essence of violet, as prepared for retail sale, is thus made, according to the quality and strength of the pomade:—Take from six to eight pounds of the violet pomade, chop it up fine, and place it into one gallon of perfectly clean (free from fusel oil) rectified spirit, allow it to digest for three weeks or a month, then strain off the essence, and to every pint thereof add three ounces of tincture of orris root, and three ounces of esprit de rose; it is then fit for sale.

We have often seen displayed for sale in druggists' shops plain tincture of orris root, done up in nice bottles, with labels upon them inferring the contents to be "Extract of Violet;" customers thus once "taken in" are not likely to be so a second time.

A good IMITATION ESSENCE OF VIOLETS is best prepared thus—

Spirituos extract of cassie pomade	. . .	1 pint.
Esprit de rose	. . . . .	½ pint.
Tincture of orris	. . . . .	½ pint.
Spirituos extract of tuberose pomade	. . .	½ pint.

After filtration it is fit for bottling. In this mixture, it is the extract of cassie which has the leading smell, but modified by the rose and tuberose becomes very much like the violet. Moreover, it has a green color, like the extract of violet; and as the eye influences the judgment by the sense of taste, so it does with the sense of smell. Extract of violet enters largely into the composition of several of the most popular bouquets, such as extract of spring flowers and many others.

**VOLKAMERIA.**—An exquisite perfume is sold under this name, presumed, of course, to be derived from the *Volkameria inermis* (LINDLEY.) Whether it has a smell resembling the flower of that plant, or whether the plant at all, we are unable to say. It is a native of India, and seems to be little known even in the botanic gardens in this country; however, the plant has

a name, and that's enough for the versatile Parisian Perfumer, and if the mixture he makes "takes" with the fashionable world—the plant which christens it has a fine perfume for a certainty!

#### ESSENCE OF VOLKAMERIA.

Esprit de violette . . . . .	1 pint.
“ tuberense . . . . .	1 pint.
“ jasmine . . . . .	$\frac{1}{2}$ pint.
“ rose . . . . .	$\frac{1}{2}$ pint.
Essence de musck . . . . .	2 ounces.

WALLFLOWER (*Cherianthus*.)—Exquisite as is the odor of this flower, it is not used in perfumery, though no doubt it might be, and very successfully too, were the plant cultivated for that purpose. To this flower we would direct particular attention, as one we consider well adapted for experiments to obtain its odoriferous principle in this country; our climate being good for its production. The mode for obtaining its odor has been indicated when we spoke of Heliotrope, page 234. And if it answers on the small scale, there is little doubt of success in the large way, and there is no fear but that the scent of the old English wallflower will meet with a demand.

An IMITATION ESSENCE OF WALLFLOWER can be compounded thus:—

Extract fleur d'orange . . . . .	1 pint.
“ vanilla . . . . .	$\frac{1}{2}$ pint.
Esprit de rose . . . . .	1 pint.
Extract of orris . . . . .	$\frac{1}{2}$ pint.
“ cassie . . . . .	$\frac{1}{2}$ pint.
Essential oil of almonds . . . . .	$\frac{1}{4}$ drachm.

Allow this mixture to be made for two or three weeks prior to putting it up for sale.

WINTER GREEN (*Trientalis Europea*.)—A perfuming essential oil can be procured by distilling the leaves of this plant: it is principally consumed in the perfuming of soaps. Upon the strength of the name of this odorous plant a very nice handkerchief perfume is made.

#### ICELAND WINTER GREEN.

Esprit de rose . . . . .	1 pint.
Essence of Lavender . . . . .	$\frac{1}{4}$ pint.
Extract of neroly . . . . .	$\frac{1}{2}$ pint.
“ vanilla . . . . .	$\frac{1}{2}$ pint.
“ vitivert . . . . .	$\frac{1}{4}$ pint.
“ cassie . . . . .	$\frac{1}{2}$ pint.
“ ambergris . . . . .	$\frac{1}{4}$ pint.

We have now described all the important odoriferous bodies which are used by the manufacturing perfumer, as derived from the botanic kingdom; it may be understood, that where an odoriferous material is unnoticed, it

has no qualities peculiar enough to be remarked on, and that the methods adopted for preparing its essence, extract, water, or oil, is analogous to those that have already been noticed, that is, by the processes of *maceration*, *absorption*, or *enfleurage* for flowers, by *tincturation* for roots and by *distillation* for seeds, modified under certain circumstances.

There are, however, three other important derivative odors—ambergris, civet and musk—which being from the animal kingdom, are treated separately from plant odors, in order, it is considered, to render the whole matter less confused to manufacturers making reference to them. Ammonia and acetic acid, holding an indefinite position to the order we have laid down, may also come in here without much criticism, being considered as primitive odors.

On terminating our remarks relating to the simple preparations of the odors of plants, and before we speak of perfumes of an animal origin, or of those compound odors sold as bouquets, nosegays, &c., it may probably be interesting to give a few facts and statistics, showing the consumption in England, of the several substances previously named:

QUANTITIES OF ESSENTIAL OILS, PAYING 1s PER POUND DUTY, ENTERED FOR

HOME CONSUMPTION IN THE YEAR 1852.

	lbs.
Essential oil of bergamot . . . .	28,574
“ “ carraway . . . .	3,602
“ “ cassia . . . .	6,163
“ “ cloves . . . .	595
“ “ lavender . . . .	12,776
“ “ lemon . . . .	67,348
“ “ mint and spearmint . . .	163
Otto of roses . . . .	1,268
Essential oil of peppermint . . . .	16,059
“ “ thyme . . . .	11,418
“ “ lemon grass . . . .	} 47,380
“ “ citronella . . . .	
And other oils not otherwise described . . .	

Total essential oils imported in one year . . . . 195,346

Paying a duty of 1s. per pound, yield a revenue annually of £9,766 16s.

It would appear by the above return that our consumption of essential oil of cloves was exceedingly small; whereas it is probably ten times that amount. The fact is, several of the English wholesale druggists are very large distillers of this oil, leaving little or no room for the sale and importation of foreign distilled oil of cloves. Again, the oil of carraway, the English production of that article, is quite equal to the foreign: also, oil of lavender, which is drawn in this country probably to the extent of 6000lbs. annually.

There were also passed through the Custom House for home consumption in 1852—

Pomatus, procured by enfleurage maceration, &c., commonly called "French Pomatus," average value of 6s.

per pound, and paying a duty of 1s. per pound, valued

by the importers at . . . . . £1,306

Perfumery not otherwise described; value . . . . . 1,920

Bottles of eau de Cologne, paying a duty of 1s. each\* . . . 19,777

Revenue from eau de Cologne manufactured out of England say 20,000 flacons at 8d. 8,000*l.* annually.

The total revenue derived from various sources, even upon these low scale of duties, from the substances with which "Britannia perfumes her pocket handkerchief," cannot be estimated at less than 40,000*l.* annum. This, of course, includes the duty upon the spirits used in the home manufacture of perfumery.

The ridiculous assertion which Dr. Lyon Playfair has made in his lectures, and published in the "Journal of the Society of Arts," in "Household Words," and "Chambers's Journal," viz., that "the main source of the essences used for perfumery were derived from the drainings of cow houses," is emphatically contradicted by the books of her Majesty's Honorable Board of Customs, independent of any chemical proof to the contrary. Such "clap-trap science" is unworthy of philosophy.—*Annals of Pharmacy.*

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*The Seeds of Asparagus a Substitute for Coffee.*—Baron Liebig has discovered that the seeds of asparagus contain large portions of taurine analogous to that which is found in coffee, and therefore may be found a substitute for that delicious and universally-adopted beverage. They have been tested in England, and found to possess all the richness, flavor and aroma of the best Mocha coffee. This will be interesting information to the consumers of coffee, as the imported article now commands an exorbitant price in our markets, while the asparagus is easily cultivated and prolific in its yield.—*Boston Medical and Surgical Journal*, July 19, 1854.

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*Alum as an Emetic.*—Besides the great usefulness of alum as an emetic for croup, it has been found in one case more efficient in poisoning by opium than the sulphate of zinc. The patient had swallowed an ounce of powdered opium! Thirty grains of sulphate of zinc were given him without effect, when Dr. Meigs, being called in, he gave him half an ounce of powdered alum, which, with three tumblers of warm water, caused copious vomiting. After a short period this treatment was repeated with a like effect, and the patient recovered. This case shows the powerful emetic properties of alum, which should be remembered in cases of emergency.—*Memphis Medical Recorder.*

\*The duty on eau de Cologne is now, according to the last tariff, 8*d.* per flacon, or 20*s.* per gallon.

## Minutes of the College.

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At a stated meeting, held 9th mo. 25, 1854.

Samuel F. Troth, First Vice President, in the Chair.

The minutes of the previous meeting were read and adopted.

The minutes of the Board of Trustees for the past six months were then read, which informed that the following candidates having presented themselves for examination, at the stated time, in June, were approved, and accordingly elected Graduates in Pharmacy:

Henry N. Rittenhouse, thesis on Buchu,

John M. Ruch, " Gillenia,

Thomas Lancaster, " Syrup of Protonitrate of Iron.

The minutes of the Board inform of the death of one of their number—**WILLIAM D. LIVERMORE**—and contain a fitting tribute to his memory.

A report was read from the Committee on Latin Labels, informing of the publication of a new edition of the labels, in bronze, on highly glazed paper.

A communication resigning his membership in the College, was received from Charles S. Braddock, and was accepted.

Letters from V. Regnault, dated Paris, Feb. 15, and from Michael Donovan, dated Dublin, Aug. 23rd, to the Corresponding Secretary, in answer to letters notifying them of election to Honorary Membership, were received and placed on the file.

The delegates appointed to attend the late meeting of the American Pharmaceutical Association, held in Cincinnati, reported, that although none of their number could arrange it to leave home at the time appointed, the College was represented at the meeting by Professor Procter, one of the original members of the Association, and by him the College was informed that, although the attendance was small, the best feeling prevailed, and a large amount of work was placed in the hands of Committees to report at the next annual meeting, to be held in New York, on the second Tuesday in September, 1855.

Copies of the *Proceedings* and of an *Address*, in pamphlet form, designed for general circulation among druggists and apothecaries, their clerks and apprentices, published by the Executive Committee, of the Association, were presented, and the following, offered by Dr. John Harris, was adopted:

*Whereas*, The American Pharmaceutical Association, at its late Annual Meeting, passed a resolution recommending to the several Colleges of Pharmacy the appointment of Committees of Correspondence, "who shall

address apothecaries in their respective sections upon the objects of the Association and for the promotion of its designs,

*Resolved*, That the Chairman appoint five members from the College at large, with a view to the objects recommended by the Association, and to distribute the 300 copies of the Proceedings falling to our share, and the five hundred copies of the "Address to Druggists and Apothecaries, their Clerks and Apprentices," subscribed for by the Board of Trustees.

The Committee was then appointed, as follows:--Dr. John Harris, Wm. J. Jenks, S. N. James, Henry M. Troth, and E. Parrish.

Prof. Thomas offered a resolution, that all the Life Members and Contributing members of the College be furnished with the American Journal of Pharmacy free of charge.

After much discussion, the resolution was referred to the Publishing Committee, to report at the next Stated Meeting.

The semi-annual election for eight Trustees resulted in the choice of

Thos. P. James,

Wm. J. Jenks,

A. B. Taylor,

C. Bullock,

S. N. James, for the unexpired term of W. W. D. Livermore,

Jacob L. Smith,

E. T. Ellis,

Dr. J. Harris,

H. C. Blair, and

deceased.

Then adjourned.

EDW. PARRISH, *Sec'y.*

## Editorial Department.

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THE LONDON PHARMACOPŒIA AND THE PHARMACEUTICAL SOCIETY.—Previous to the last revision of the London Pharmacopœia, the Royal College of Physicians, as had been previously their habit, employed Mr. Richard Phillips to perform such chemical investigations as were needed during the revision, and they also addressed circulars to several individual pharmacutists eliciting special practical information. The council of the Pharmaceutical Society being of the opinion that the Royal College would be best served by addressing the Society in its official capacity, this opinion was communicated to the College, who at the time did not avail themselves of the Society's aid, although they entertained the suggestion, and have recently opened the subject, which has resulted in the appointment of a "Committee of Revision" by the Council of the Pharmaceutical Society, consisting of Messrs. Dean, Davenport, Squire, Mason, Hooper, Garden, and Bell, who will report to the Council. We regard this movement as indicative of a great improvement in the *standing* of the Pharmaceutical Chemists of London, and of the good feeling of physicians toward them, as the Royal College is perhaps the most aristocratical medical body in the world.

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CAVENDISH SOCIETY.—There are now twelve volumes of the publications of this Society to be had on subscribing, viz., 8 volumes of Gmelin's Handbook, 2 volumes of Lehmann's Physiological Chemistry, the Atlas of Microscopic Drawings, by Otto Funke, to accompany it, and the Life of Cavendish. There is yet due to the Subscribers for 1853, the 1st volume of Bischoff's Elements of Chemical and Physical Geology; and the Life of Dalton, by Dr. Henry, of Manchester, is published in England but has not reached the Secretaries here. It is to be regretted that so much delay attends the issue of the books. Bischoff's work has been kept back by the author's delay in furnishing the revised sheets; why the third volume of Lehmann has not appeared we are not informed. The six volumes of the Handbook of Gmelin, comprising the whole of the inorganic chemistry, can now be had separately of the Secretary at Philadelphia, as per advertisement.

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*Handbook of Chemistry, Theoretical, Practical, and Technical.* By F. A. ABEL, Professor of Chemistry at Woolwich, &c., and L. BLOXAM, of the Royal College of Chemistry. *With a Preface by Dr. HOFFMAN, and numerous Illustrations on Wood.* Philadelphia; Blanchard & Lea. 8vo. pp. 681. 1854.

Many years have not elapsed since the chemical student, who sought information on any of the practical points relating to analytical investigation, had to search in the treatises of Continental Europe. The few works of English and American origin were confined chiefly to descriptive chemistry,



and the translations were few and mostly of the same nature. The change commenced with Griffin's Translation of Rose, in 1831, and subsequently Liebig and Frezenius have been transformed. Since then, the English, slow to move, but steady and onward when started, have taken hold of the subject, and we have had a series of works on analysis, by Bowman Noad, and now the handbook of Messrs. Abel and Bloxam, which differs materially from any of its predecessors, in so far as it is a combination of descriptive and analytical chemistry, and is intended as a guide—a *handbook*—for the laboratory student.

In taking a bird's-eye view of the book it will be found to consist of three parts, besides an introductory chapter, of about twenty-five pages, on specific gravity, the laws and rules of crystallization, solution, chemical affinity, chemical notation, etc. The first of these divisions is on chemical manipulation, and is a condensed view of the subject presented in Farraday's or Morfit's Manipulations, embracing gascemetry, distillation, solution, evaporation, crystallization, and the various branches of heat manipulation, requiring furnaces blowpipes, crucibles, etc., describing apparatus, and the manner of mounting and using it.

The second principal division, entitled Elementary Chemistry, describes the non-metallic and metallic elements, and their principal binary and saline compounds, and extends over 480 pages. In general, the descriptions are terse, lucid, well illustrated with symbolic notations, and eminently practical; being thereby better adapted to laboratory purposes. The authors have extended those articles which bear a prominent position in the arts, as gunpowder, cement, glass, steel, etc. They have introduced numerous foot notes, referring to other methods of preparing substances, or to recent or uncorroborated observations which assist the reader materially. In reference to the peculiarities of the authors' arrangement, a little needs to be said. Ozone is brought in under oxygen, ammonia under nitrogen, cyanogen under carbon. The grouping of the metals is somewhat different from that usually found. Gold and the platinum metals are grouped with copper and cadmium, whilst silver, lead and mercury are associated.

After having passed through the description of metallic bodies, the reader is struck with the abrupt termination of the descriptive chapters by the entire omission of organic chemistry. Nor will he, on carefully reading the preface, be able to ascertain what reason the authors offer for so important an omission, at this time, when organic chemistry claims so much interest from all interested in chemical science. There is another *hiatus* yet to be filled, not only in this but in other analogous works, and one that is greatly needed by the pharmacist and physician, that is a *treatise on the proximate analysis of organic substances*. Such a treatise would have been peculiarly appropriate in this work, intended, as it is, for the analytical student. We know of no work on this subject in the English language, and in French the treatise of Chevreul, published in 1824, is too ancient to be of much service now-a-days. What we mean, is a work that will go into the details of the manipulations required in the isolation and purifica-

tion of vegetable and animal principles, giving not only the method of qualitative analysis, but the more difficult ones by which the chemist is enabled to determine the quantitative proportions of the several proximate ingredients of plants or animals, or their parts. Such a work can only be written by a chemist, experienced in *treating* organic matter, both as regards the detection of principles admixed with others, and with their intimate mutual relations and reactions, so as to point out successful means of separating them without decomposition or change.

The third division of the book is devoted to analytical chemistry. The methods given are in the main those employed at Dr. Hoffman's laboratory, in the College of Chemistry, at London. In this part of the work the authors are perfectly at home, and write from their own experience the directions they offer to others; they have not unnecessarily burthened the directions with detail, and have, wisely, we think, introduced practical examples of analysis, instead of abstract statements of the modes of proceedings under certain circumstances. Having omitted organic chemistry, the ultimate analysis of organic bodies is also omitted, which would hardly have been expected, unless it be the design of the authors to bring out a separate treatise on the chemistry and analysis of organic substances.

Among the practical examples of analysis, we notice those of chrome ore, pewter, type metal, tartaremetic, ultramarine, soils, mineral waters, glass, and the ashes of vegetable and animal substances. The publishers have advantageously introduced a number of wood-cuts, illustrative of the text, the original being entirely without them.

The paper and printing is of good quality and style, but our time has not permitted a critical examination of the typography, which, from the very free use of chemical equations, has been necessarily more liable to error.

Upon the whole, we have been gratified with the book, and believe it will prove useful to students of practical chemistry, as well as to druggists and others, who often need the kind of information it offers. As "a handbook of chemistry, theoretical, practical, and technical," it is certainly deficient in the absence of the description of organic substances, which now, especially to physicians and pharmacutists, constitutes the most interesting, if not the most important part of chemical science.

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*The American Eclectic Dispensatory.* By JOHN KING, M. D., Prof. of Obstetrics in the Cincinnati Eclectic Medical Institute, and formerly Professor of Materia Medica in Memphis Institute. Cincinnati: Moore, Wilstach & Keys, 1854, pp. 1391.

The publishers of the American Eclectic Dispensatory, having politely sent us a copy of that work, we have taken some pains to give it a careful examination, although pressed for time.

That a numerous sect of medical practitioners should grow into existence, become organized into societies, and have schools for medical instruction, embracing all the branches of regular institutions, adapted to their peculiar

tenets, and with a *materia medica*, to a large extent botanical and indigenous, within ten years past, is certainly a phenomenon in the medical history of the United States of no ordinary interest. To trace out the history of this sect—which calls itself *Eclectic*, and which assumes to be catholic in selecting the good principles and agents of all medical systems—is neither our object, nor are we in command of the proper data to do it correctly; yet it may be well to remark, *en passant*, that had it not have been for Samuel Thompson, who is now so carefully forgotten, and who was the originator of the so-called system of *Thompsonianism*, which a few years since spread over this land like an epidemic, and gained credence with hundreds of thousands, *Eclecticism* would probably have been yet unborn. Thompsonianism formed the material basis, and gave the impetus to botanic medicine; the zealous energy of its early, earnest and bigotted practitioners, spread Thompson's ideas, especially over the Western States; the idea that each individual head of a family should in medicine, as in religion and politics, think and act for himself, presented so inviting an aspect to the yeomen of the land, that his medical system was adopted as a revelation, and *Lobelia* and *Capsicum* were extolled as the universal panacea for American diseases. In process of time, the practice fell into the hands of special persons, these became gradually more enlightened and less bigotted, some of them attended the lectures and clinical instruction of the medical schools, and returning among their associates modified their practice. The writings of Beach have doubtless had an influence, and the strong predilection of Prof. Tully, of New Haven, for our indigenous *Materia Medica*, upon which he dwelt pointedly in his lectures, induced some able men to turn their attention to the botanical practice. Meanwhile, the narrow limits of the Thompsonian *Materia Medica* had widened; to emetics, stimulants and diaphoretics, cathartics, alteratives and refrigerants had been added; from the universal repudiation of mineral medicines, one after the other of the metallic and saline remedies were introduced, until in modern *Eclecticism*, with the exception of mercurials, antimonials, arsenicals and some others, the whole range of the metallic *Materia Medica*, with an extensive array of vegetable medicines, have been embraced, requiring for their description and arrangement the massive volume now under consideration. At present, some half dozen schools teach the doctrines of *Eclecticism*, and are gradually raising the *status* of their graduates, and it is probable that in a few years they will gravitate more and more towards regular medicine, until they are assimilated, carrying with them some valuable views and agents.

In thus alluding to the origin and progress of *Eclecticism*, it is with no disposition to deery its merits or bring it into disrespect; but rather as an explanation of what may be esteemed a remarkable episode in the history of American medicine and pharmacy.

Our limits will not admit of a detailed notice of the "*Eclectic Dispensatory*" of Dr. King. The author remarks:

"It may not be known to some of the readers of this work, that a great

amount of highly important knowledge, in reference to the therapeutic value of remedies, and especially of our Native American plants, has been accumulated by liberal minded physicians in America; which knowledge, owing to various causes, has never yet been sufficiently brought before the medical profession generally, and has not been embodied in the voluminous standard works of Pereira, Wood & Bache, Dunglison, etc. This knowledge being especially American in its origin, and having produced a marked peculiarity in the practice of a large number of American physicians, we deem it proper to style this work the "AMERICAN Eclectic Dispensatory," to distinguish it from other works, which contain only the ideas and views which are common to both American and European physicians."

Our author, after enumerating more than one hundred and twenty indigenous plants, and numerous, so-called *principles*, as aletrin, apocynine, caulophylin, &c., the knowledge of which, he claims as the fruits of eclecticism, remarks:

"The extensive use of the foregoing articles, and their consequent substitution on many occasions, for the favorite remedies formerly in use, constitutes a practical improvement, the value of which, can scarcely be estimated; and the simplest statement of what we believe and know to be true, as regards the superior success in practice, resulting from these improvements in the *Materia Medica*, would be regarded by those entirely unacquainted with the facts, as the language of extravagant enthusiasm. For their truth, however, we can but appeal to the final tribunal, *universal experience*; and it is partly with the view of facilitating this appeal by candid physicians, that this volume is laid before the public; in which, we trust, every medical reader will find sufficient information, in reference to the favorite remedies of Eclectic physicians, to enable them to enjoy in practice, what we deem the richest fruits of modern clinical experience; constituting the most recent and important practical improvements in the healing art."

These extracts will exhibit that Eclecticism has a good opinion of itself, what ever may be the esteem of others, a trait usual to reformers; yet like many other movements in the same direction, it embraces many old ideas and old agents in new dresses and shapes, commingled with some originality.

But to return to our task. The work is divided into three parts. The first 130 pages, are devoted to a succinct description of the natural orders of plants contributing to the *Materia Medica*, with the characters of the genera ranged under each, which supercedes the necessity of noticing them in the second part of the work.

The second part, devoted to the eclectic *Materia Medica*, embraces 840 pages; and describes 540 distinct articles, both vegetable and mineral. Among the latter, are chromic, hydriodic, hydrochloric, nitric, nitromuriatic, phosphoric and sulphuric acids, alum, muriate of ammonia, salts of iron, zinc, lead, potassa, soda, etc., iodine, bromine, sulphur, phosphorus, and many other inorganic bodies. In the description of substances, the author gene-

rally ranges them under their scientific name, and gives the vulgar names after. The specific characters then follow, then the history including habitat, parts used, and chemical characters, followed by an account of the medical properties and uses. A striking feature of this part of the work, is the almost total absence of references to authorities or discoverers, unless they be Eclectic; a stranger to the subject, glancing over these pages, would suppose the Eclectics were a highly scientific and learned body, that they had extensively investigated the chemical relations of their *Materia Medica*; but this arises from the fact, that the author rarely gives credit to chemical writers and investigators. Long processes for new principles, complex arrays of constituents, and intricate reactions, are numerous given without allusion to their authors, (in most instances,) unless they be eclectics, when they are brought forward in bold relief. The injustice of this course, and its egotistical results, deserve to be pointed out. The author, at the conclusion of the preface, acknowledges his indebtedness to a long list of works, as the U. S. Pharm., U. S. Dispensatory, Pereira, Christison, Danglison, Mohr and Redwood, Journal of Pharmacy, etc. etc.; but the discoverers and observers themselves, who have given time and talent to eliminate the knowledge of facts, are, in general, left unnoticed. One of the chief difficulties of the author of a Dispensatory is to investigate the accuracy of chemical, botanical and therapeutical statements, and to give the authorities upon which they rest, that the reader may satisfy himself, if disposed; or subsequent authors consult the original memoirs. But our eclectic author feels satisfied to declare results and make assertions, leaving the reader to believe or doubt his statements without redress. One of the most prominent features in that part of Dr. King's work which is strictly eclectic, is the account of the "principles," "resinoids," or "concentrated remedies," which are adopted in their practice. Their nomenclature of these substances is entirely adverse to chemical science, inasmuch as it conveys the idea of distinct neutral proximate principles; when, in most instances, they are merely complex associations of distinct principles, in which one or more predominate, and they seem to have got the idea, that to purify an organic principle, is to strip it of its therapeutic power. Why then is not extract of bark stronger than quinine or cinchonine? or crude resin of jalap more effective than jalapin? Perhaps no one of the eclectic remedies has been more extolled than the resin of *podophyllum peltatum*, Dr. King claims the discovery of the therapeutic value of this resin, which he had used in an impure state some eighteen years ago. Wm. Hodgson, Jr., had previously isolated this resin in a modified state; but its true nature and place among chemical principles, was not discovered until John R. Lewis proved its close analogy to jalapin in being insoluble in ether; Mr. Lewis, who made his experiments in the summer of 1846, under our directions, isolated *podophyllum* resin in a colorless state, and we well remember when he imprudently took six grains of it, producing bloody stools, griping and vomiting with much debility. Our author, at page ix. of his preface, remarks, "but unfortunately for the purity and medicinal activity of Lewis's *podophyllin*,

it requires *six grains to act as an ordinary cathartic*, while that of Merrell requires only half a grain to a grain and a half, thus proving the latter to contain three or four times as much of medicinal activity of the root, as the former."

The *aloësin* of Robiquet, and the *aloin* of the Messrs. Smith, of Edinburgh, are described in detail in separate chapters, without any allusion to their discoverers; and so of other principles.

In speaking of ethereal oil (extract) of capsicum, Dr. King states that it is frequently filled with "*crystals of capscin in dendroid forms.*" These apparent crystals are the solid, fatty matter which separates from the ethereal extract, and which has been described by Dr. Plummer, of Richmond, Ind. (Amer. Jour. Pharm. vol. 24 page 32.,) Pure capscin has never yet been isolated; the so-called capscin of Bracconot, is a mixture of principles. (See U. S. Disp. 10th edition.)

So far as our examination has extended, we cannot find a single instance in this work of a real chemical analysis of eclectic origin, and the obscure and ignorant manner in which writers in the eclectic journals announce and describe their discoveries, goes to corroborate this. The numerous plants which are brought forward as eclectic remedies, embrace many of undoubted value, and which owe their virtues to distinct principles—chemically distinct—these afford an ample field for discovery. Let correct chemical research be applied, and the impure compounds which now figure as "principles," and which are a stigma on the science of the Eclectics, will soon give way to the true, active, proximate principles where these exist. The graduates of the Philadelphia College of Pharmacy have done more in this field, than any other class of investigators, in the pages of the American Journal of Pharmacy, witness the analyses of Lobelia, Hydrastis, Podophyllum, Rhus, Populus, Veratrum, Prunus, etc.

Having been thus candid, as regards some of the short-comings of Dr. King's book, it would ill become us to pass over the real merits of the work, which embodies a large number of facts of a therapeutical character, which deserves to be studied. Many of these are crude, but yet are capable of being advantageously adopted by physicians, especially country physicians who have the advantage of more easily getting the plants. To trace much of this knowledge to its original germs, we should have to go back to the Indian tribes and the early settlers of the West, who learned from them, or by accident, the virtues of a large number of our native plants. Quack doctors and herb doctors have aided. We have only to look back in the history of regular Therapeutics, to find a similar origin of the knowledge of some of its valuable remedies; and it is but the other day, since the ignorance of a negro slave started the train of circumstances, which developed the remarkable qualities of the Gelsemium of our Southern States, and which now figures in the list of substances "strictly eclectic." The attention which is now being given by the Eclectics, in classifying and arranging facts and observations relative to American plants, will certainly be attended with excellent results; and we may look for their greater progress

when more real science becomes commingled with their recorded observations.

The third portion of the work, on pharmacy, is arranged as in the United States Dispensatory, with a preliminary chapter on the generalities of practical pharmacy. Eclectic pharmacy is largely indebted to William S. Merrell, a druggist of Cincinnati, who has contributed a chapter to Dr. King's work, on the "Composition of Vegetables and their proximate principles," &c., page 994-1004, and another on the "fluid extracts," at page 1067, in which he has given correct views of the selection and adaption of menstrua, the means of extraction, etc.; which are the more necessary, as a large number of those who prepare eclectic medicines are inexperienced.

In glancing over this part of the book, one might easily think he was looking at the United States Dispensatory, but he is soon disabused of the error, by meeting with such names as the following: *Extractum Caulophylli Hydroalcoholicum*, *Extractum Pteleæ Hydroalc: Ferri et Salicinæ tartras*, *Lotio Hydrastis et Aconiti*, *Pilulæ Podophyllini Comp: Pulv: Leptandrini Comp: Trochisci Dioscoreini*, &c. &c. In fact, the pharmacy of eclecticism proper, is strictly *galenical*; the exact chemical preparations are nearly all those of our shops. Such preparations as *Ferri et morphia citras*, *Ferri et salicinæ tartras*, *Ferri et quiniæ tartras*, which are brought forward as the discoveries of Prof. J. Milton Sanders, are, like the citrate of iron and quinine of our own shops, inexact and empirical preparations, especially when made by the directions given; and it is a little to be wondered at, that so odd and ill assorted a combination as tartrate of iron and morphia should have found the prominent place Dr. King has given it, with so special a parade of the claims of the discoverer.

The galenical preparations, extracts, syrups, tinctures, etc., peculiar to the eclectic dispensatory, are mostly well constructed preparations, containing the virtues of the ingredients used; and we have no doubt that many of them are valuable agents. An account of one of these, *Leptandrin*, we have copied at page 505, to which the reader is referred.

It would afford us much pleasure to extract a number of other articles from the Eclectic Dispensatory, that would give a better idea of the peculiar views and opinions of this sect of practitioners; but the length of this article admonishes us to stop; yet we cannot close without adjudging to Dr. King the merit of having improved on the works of his predecessors, in giving perspicuity and order to the vast mass of material collected under the name of botanical medicine, and for his determination to oppose the wholesale quackery of eclectic chemical institutes. The eclectics have opened a wide field for the rational therapist, and the organic chemist; and we hope that physicians and apothecaries will not be repelled by a false pride or an unjust feeling of contempt, from reaping the harvest which will accrue to observation and experiment. Although the Eclectics have "stolen our thunder" largely, they have also *thundered* a little themselves;



and raised the *status* of a large number, who might have yet been Thompsonians or even quacks, and for this they are to be commended.

As regards the book itself, it is gotten up in a highly creditable manner, is well printed on good paper, and, so far as we have examined, contains but few typographical errors.

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*Tully's Materia Medica.* Nos. 10 and 11.—We have received the tenth and eleventh numbers of Dr. Tully's work, which are occupied mainly in the Proöm to the extensive class "Leäntica," which includes general remarks on the gummy, amylaceous, oleaginous, saccharine, gelatinous and albuminous demulcents. This class has been extended to include a large number of substances (species) not officinal, and it would appear that the author intends it as an encyclopædial reference. The work has already reached the 700th page and has not progressed beyond generalities. At the end of the 11th number it is hinted that the size of the work will reach several octavo volumes, perhaps four or five, consequently it will be impossible to give a fair notice until it has progressed farther. The style is frequently dogmatical, and we think too much rests on the *ipse dixit* of the author. It is however right to bear in mind that the part issued does not reach the regular descriptive chapters. The following quotation will exhibit the author's style, viz.

" { MORRHUA CALLARIAS (*J. G. Wood.*)  
       { *Gadus Morrhua* (*Linn.*)

In one edition of the *Systema Natura* of Linnæus in my possession, the common Cod is called *Gadus Morhua*, and *Gadus Callarias* is given as the name of the Torsk. In another edition *Gadus Morhua* is still given as the name of the Cod, while it is denied that *Gadus Callarias* is the Torsk, which is said to be *Gadus Brosmé*. In a comparatively late work, in which the Linnæan genus is divided, that genus which contains the Cod is called *Morrhua*, and this species is called *Morrhua Callarias*, which seems to make *Gadus Morrhua* and *Gadus Callarias* (*Linn.*) the same.

#### OLEUM JECINORIS. MORRHUÆ CALLARIÆ.

By the article which immediately precedes, I intend what is commonly prescribed under the name of Cod-Liver Oil, but, as I doubt not, I have referred it to the wrong animal. At least nine hundred and ninety-nine thousandths of all that has been recently employed in medicine, has been derived not from a Fish, but from one or two Sea-Mammals, viz. the following.

{ PHYSETER MACROCEPHALUS, (*Linn.*)  
   { *Catodon macrocephalus* (*Griff. Cuv.*)

BALÆNA MYETICETUS (*Linn.*)

*Oleum pinque liquidum, Physeteris macrocephali.*

*Oleum pinque Balæne Mysticeti.*

These last two Greasy Oils I believe are never used as Leäntics, except as substitutes for Cod-Liver-Oil, though they are undoubtedly as good for this purpose as any other Greasy Oil. People of the Hyperborean Race, I imagine, would make no objection to taking these Oils whenever a Leäntic

should be needed, and would probably prefer them to any other oil which I have mentioned. A very considerable number of physicians within my knowledge, after using what they considered as genuine Cod-Liver-Oil for a comparatively long time, and in connexion with this having opportunity to observe what were considered to be the effects of Sperma Ceti and Whale Oils (so called) have relinquished the employment of the former, and in its stead have adopted the latter two, on the ground that they are just as good, and considerably cheaper. All of these gentlemen profess to think highly of the efficacy of Cod-Liver-Oil; but they have arrived at the conclusion that every other liquid Greasy Oil has the same power and is capable of producing the same effects. For myself, I have watched often and long for the effects of Cod-Liver-Oil (so supposed to be) not prescribed by myself, but by my professional acquaintance, and yet I never witnessed anything but a Leëntic, and perhaps nutrient operation. It is true I feel no confidence that it was true and genuine Cod-Liver-Oil that I saw employed; but still I do not imagine that this was of much importance. I have accidentally received information that some large dealers in Cod-Liver-Oil have been in the habit of purchasing large quantities of Lamp Oil of a wholesale establishment in a large city which they never sold as Lamp Oil at their own place of business. I have therefore been in the habit of supposing that true and genuine Cod-Liver-Oil is just about as often sent at the prescription of a physician as true and genuine Wine, by which I mean the pure juice of the grape duly and properly fermented. However, I do not think that the difference between Cod-Liver Oil and Lamp-Oil is of any material importance, while I should greatly prefer the properly fermented pure juice of the Grape to Turnip-juice and bad Brandy, or any of the more common substitutes for Wine. I never yet had opportunity to converse with a physician who had any notion of what the properties of Cod-Liver-Oil might be properly called."

The interest of Dr. Tully's work increases as it progresses, and we trust he will receive sufficient encouragement to bring it out as rapidly as possible.

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*The Physician's Visiting List, Diary and Book of Engagements for 1855.*  
Philadelphia. Lindsay & Blakiston.

This useful little annual has again made its appearance, and is ready for serving the medical profession, during 1855, as faithfully as its predecessor has been and is doing the current year.

The attentive use of this diary will induce habits of order and punctuality in individuals whose mental construction gives the opposite tendency, and enables them to overcome the strong temptation to irregularity; besides, it will further their interests by presenting an unmistakable record of their actual services during the day, ready for the ledger in the evening.

The "Diary" is in pocket-book form, neatly covered with leather, and contains a pocket for depositing memoranda. Our medical friends should provide themselves in season.

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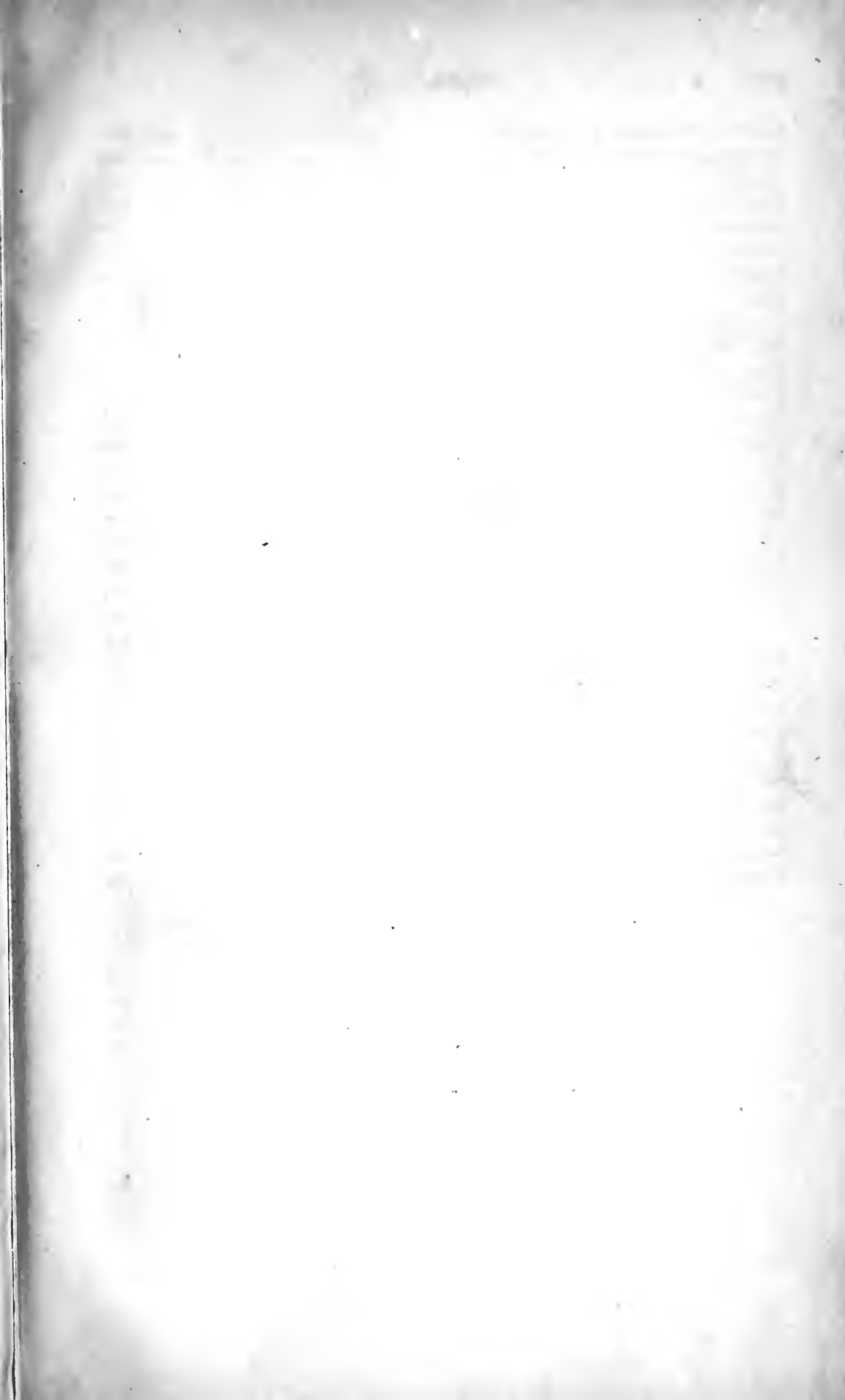
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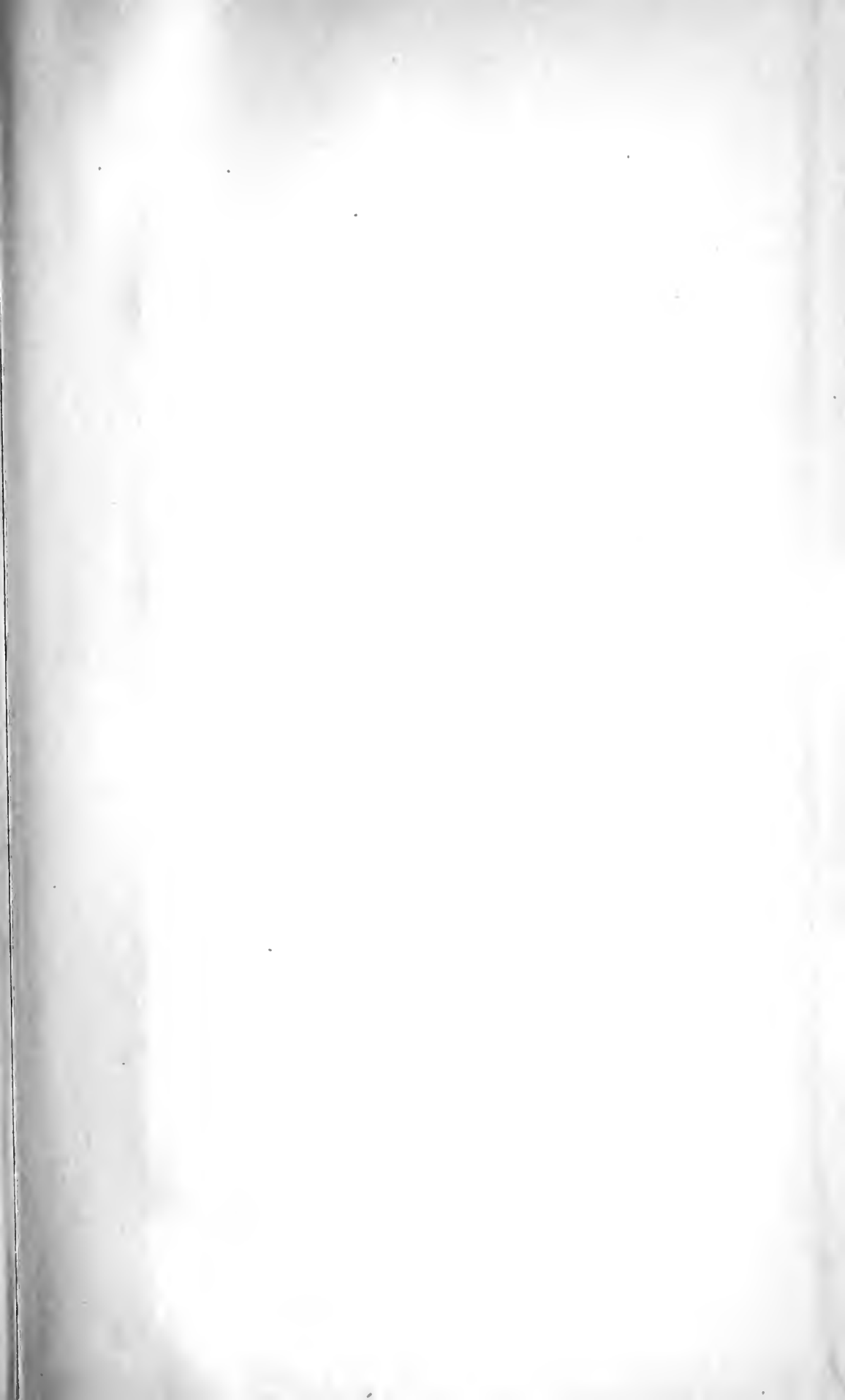
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